

ANALYSIS OF COMPUTER SERVICES INDUSTRY

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ANALYSIS OF COMPUTER SERVICES INDUSTRY
FINANCIAL PARAMETERS

PRESENTATION FOR
GTE DATA SERVICES

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INPUT

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PRO
DATA

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PURPOSE

- o THIS DATA HAS BEEN DEVELOPED TO ASSIST GTEDS IN ITS ACQUISITION ACTIVITIES. THERE ARE THREE BASIC PURPOSES:
 - SET FORTH AVERAGE FINANCIAL MEASURES TO PERMIT EVALUATION OF CANDIDATE FIRMS AGAINST THOSE AVERAGES.
 - SET FORTH MARKET VALUATION MEASURES TO ASSIST IN DETERMINING THE PRICE WHICH COULD REASONABLY BE PAID.
 - DISTINGUISH THE MATERIAL DIFFERENCES IN FINANCIAL MEASURES AND VALUATIONS AS THEY EXIST BETWEEN INDUSTRY SECTORS.
- o PROVIDE GTEDS WITH A SYSTEMATIC QUANTITATIVE ENTRY TO THE ACQUISITION PROCESS USEFUL GAUGING CANDIDATES WHICH APPEAR EITHER SYSTEMATICALLY OR SERENDIPITOUSLY.

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INTRODUCTION

- o FOR THIS ANALYSIS DATA WAS GATHERED ON 105 PUBLICLY HELD INFORMATION SERVICES INDUSTRY FIRMS.
- o APPROXIMATELY 6,400 DATA ITEMS FOR THE YEAR 1983 & 1984 WERE GATHERED OR COMPUTED. SOURCE EMPLOYED WERE THE AUDITED FINANCIALS OF THE 105 PUBLICLY REPORTING FIRMS AS PRESENTED IN ANNUAL REPORTS OF THE FIRMS, SEC FILINGS AND ELECTRONIC DB'S. INPUT FILES, THE SECURITIES EXCHANGE COMMISSION AND DISCLOSURE, INC. WERE THE PRINCIPAL REPOSITORIES SEARCHED FOR FINANCIAL DATA.
- o HISTORICAL STOCK PRICE INFORMATION FOR MANY SMALL OTC COMPANIES IS NOT MAINTAINED BY ANY CENTRAL SOURCE. ACCORDINGLY, BACK ISSUES OF BARRON'S FINANCIAL WEEKLY WERE CONSULTED. FOR NYSE & ASE COMPANIES THE PRICE USED IS THE CLOSE OF THE TRADING DATE NEAREST THE LAST DAY OF THE YEAR (OR QUARTER). FOR COMPANIES NOT MEETING BARRON'S LISTING REQUIREMENTS, TELEPHONE CALLS WERE PLACED TO A FINANCIAL OFFICER OF THE COMPANY TO DETERMINE RELEVANT STOCK PRICES.

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INTRODUCTION (continued)

- o COMPANIES WITH FISCAL YEAR-ENDS OTHER THAN 12/31 WERE ALIGNED FORWARD OR BACKWARD BASED ON MONTH NEAREST 12/31. ACCORDINGLY A FIRM WITH A YEAR END IN FEBRUARY 1984 WAS "PUSHED BACK" TO DECEMBER 1983. THE DISTORTIONS CAUSED BY THIS ARE NOT BELIEVED MATERIAL IN THE AGGREGATE.
- o COMPANIES IN THIS GROUP ARE GENERALLY COMPARABLE TO THOSE IN INPUT'S VENDOR WATCH PUBLICATION. DIFFERENCES OCCUR HOWEVER DUE TO THE WAY "VEN-WATCH" DATA IS COMPILED ON A "ROLLING QUARTER," AS-REPORTED BASIS. RE-STATEMENTS FOR ACQUISITIONS OR ACCOUNTING REASONS WILL NOT NECESSARILY BE REFLECTED IN VEN-WATCH BUT ARE SEEN IN THIS DATA. ANNUAL DATA WAS CHOSEN DUE TO THE ACCOUNTING IMPRACTICALITY OF ACCURATELY SYNTHESIZING BALANCE SHEET AND P&L ITEMS FROM SOMETIMES UNAUDITED QUARTERLY DATA FOR 105 COMPANIES.

INPUT

INTRODUCTION (continued)

- o FIRMS ARE CLASSIFIED AS ONE OF FOUR TYPES BASED ON THEIR PRINCIPAL LINE OF BUSINESS, AS A RESULT, THERE IS SOME DISTORTION IN GROUP AVERAGES OF AN INDETERMINABLE AMOUNT, PARTICULARLY AMONG VERY LARGE FIRMS SUCH AS COMPUTER SCIENCES (CSC) WHICH ENGAGES IN BOTH PROFESSIONAL SERVICES AND PROCESSING. SINCE COMPANIES PUBLISH ONLY CONSOLIDATED P&L'S AND BALANCE SHEETS, THIS DISPERSION IS UNAVOIDABLE.
- o AS PRESENTED, RATIOS ARE WEIGHTED AVERAGES. FOR EXAMPLE MEAN NET MARGIN IS COMPUTED FROM THE SUMS OF REVENUE AND NET INCOME IN A SECTOR. IT IS NOT THE ARITHMETIC MEAN OF THE INDIVIDUAL COMPANY NET MARGINS. THIS REMOVES THE DISTORTION CAUSED BY ABERRATIONS IN SIZE, MARKET VALUATIONS, MARGINS AND RATIOS CAUSED BY SMALL COMPANIES IN "UNUSUAL" CIRCUMSTANCES.

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

PROCESSING SERVICES

FINANCIAL

	<u>1983</u>	<u>1984</u>	<u>%</u>
REVENUE	\$ 83,569	\$ 100,165	19.9
NET INCOME	7,869	8,810	12.0
NET MARGIN	9.4%	8.8%	-6.6
EQUITY (BOOK)	51,623	59,490	18.1
R.O.E.	15.2%	14.8%	-2.2
ASSETS	102,556	120,618	17.6
R.O.A.	7.7%	7.3%	-4.8
SALES/ASSETS	0.81	0.83	1.9
R.P.E.	76.099	75.910	-0.2
WORKING CAPITAL	15,433	23,454	52.0
WORKING CAPITAL/REV.	.185	.234	26.8
BOOK/SHARE (\$)	5.04	5.35	6.2

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

PROCESSING SERVICES

VALUATION

	<u>1983</u>	<u>1984</u>	<u>%</u>
MARKET/BOOK	4.14	2.74	-33.8
P/E	27.2	18.5	-32.0
MARKET VALUE	213,846	163,073	-23.7
MARKET/SALES (\$)	2.56	1.63	-36.3
S/P 500 PE	11.8	10.1	-14.4
P/E MULT	2.3	1.8	-22.7
SP 500 INDEX	164.9	167.2	+1.4

INPUT

PROCESSING COMMENTS

- o YEAR TO YEAR, PROCESSING COMPANIES TURNED IN A STRONG REVENUE GROWTH PERFORMANCE AVERAGING AN ALMOST 20% (19.9) INCREASE.
- o EARNINGS LAGGED RESULTING IN AN EROSION IN MARGINS OF A MODERATE NATURE. MARGINS DROPPED FROM 9.4% to 8.8%.
- o DESPITE THE MARGIN EROSIONS, THE COMPANIES WERE ABLE TO CONTRIBUTE STRONGLY TO EQUITY WHICH INCREASED 18.1%.
- o RETURNS ON EQUITY WERE ESSENTIALLY STABLE AT 15.2 - 14.8% IN 1983-1984 RESPECTIVELY
- o ASSETS LIKEWISE INCREASED A SUBSTANTIAL 17.6% WITH SOME DECREMENT IN THE R.O.A. TO 7.3%.
- o REVENUE GENERATION POWER OF \$1.00 IN ASSETS INCREMENTED MODESTLY TO \$0.83 in 1984.
- o EMPLOYEE PRODUCTIVITY WAS ESSENTIALLY FLAT AT ABOUT 76K PER PERSON IN BOTH YEARS.

INPUT

PROCESSING (continued)

- o LIQUIDITY AS MEASURED BY WORKING CAPITAL IMPROVED MARKEDLY, LEAPING 52%. THE RATIO OF WORKING CAPITAL TO REVENUE CLIMBED VERY SUBSTANTIALLY, ALMOST 27%.
- o WHILE EQUITY INCREASED MARKEDLY, COMPANIES ISSUED ADDITIONAL SHARES RESULTING IN A MODEST INCREASE IN BOOK VALUE PER SHARE TO \$5.35 FROM \$5.04. (EQUIVALENT GTE VALUE WAS \$33.89 in 1983).
- o WHILE COMPANY FINANCIAL PERFORMANCE - OTHER THAN MODERATE MARGIN EROSION - WAS QUITE GOOD, MARKET VALUATIONS AND RELATED PARAMETERS FELL PRECIPITOUSLY. THE AVERAGE MARKET VALUE OF A PROCESSING SERVICES FIRM DROPPED 23.7% YEAR-END TO YEAR-END.
- o SINCE EARNINGS INCREASED, P/E RATIOS DECLINED A SHARP 32% WHILE MARKET TO BOOK DECLINED 33.8% TO 2.74 FROM 4.14.
- o THESE EFFECTS WERE NOT DUE TO GENERAL MARKET CONDITIONS. P/E'S OF THE S/P 500 DECLINED 14.4% INDICATING THE P/E DROP IN PROCESSING SERVICES WAS MUCH MORE SEVERE AT ALMOST 24%.

INPUT

PROCESSING (continued)

- o DURING THIS TIME, THE S/P INDEX WAS APPROXIMATELY FLAT INDICATING STABLE VALUATIONS FOR THE BROAD MARKET INDEX.
- o BETA ANALYSES HAVE SHOWN LARGE DOWN-MARKET BETAS FOR STOCKS IN THIS INDUSTRY. PRICE ACTION OF THIS NATURE SHOULD BE TAKEN INTO ACCOUNT IN GTED'S ACQUISITION STRATEGY. WHILE NOT AN APPEALING PHENOMENON TO ORDINARY EQUITY INVESTORS, THE "DOWN-DRAFT" BEHAVIOR OF VALUATIONS COULD SIGNIFICANTLY BENEFIT GTEDS IN TERMS OF PRICE PAID FOR SPECIFIC ASSETS. AS WE SHALL SEE, ALL SECTORS EXHIBIT THIS PHENOMENON TO SOME EXTENT.

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

SOFTWARE

FINANCIAL

	1983	1984	%
REVENUE	\$ 41,883	\$ 56,885	35.8
NET INCOME	3,600	3,495	-2.9
NET MARGIN	8.6	6.1	-28.5
EQUITY(BOOK)	33,046	37,655	13.9
R.O.E.	10.9	9.3	-14.8%
ASSETS	49,589	62,863	26.8
R.O.A.	7.3%	5.6%	-23.4
SALES/ASSETS	0.84	0.90	7.1
R.P.E.	91.764	101.566	10.7
WORKING CAPITAL	22,722	23,715	4.4
WORKING CAPITAL/REV.	.548	.417	-23.9
BOOK/SHARE	4.06	4.53	11.6

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

SOFTWARE

VALUATION

	<u>1983</u>	<u>1984</u>	<u>%</u>
MARKET/BOOK	4.23	3.48	-17.7
P/E	44.9	33.6	-25.2
MARKET VALUE	161,826	117,374	-27.5
MARKET/SALES	3.86	2.06	-46.6
S/P 500 PE	11.8	10.1	-14.4
P/E MULT	3.8	3.3	-13.2
SP 500 INDEX	164.9	167.2	1.4

INPUT

SOFTWARE COMMENTS

- o SOFTWARE COMPANIES AS A GROUP TURNED IN A SPECTACULAR 35.8% INCREASE IN REVENUE IN '84 OVER '83. THIS AGGREGATE GROWTH WAS PROPELLED BY EXPLOSIVE DEMAND FOR MICRO-SOFTWARE WHICH HAS SINCE EBBED.
- o EARNINGS PERFORMANCE DID NOT TRACK REVENUE HOWEVER AND EARNINGS DECLINED MODESTLY IN THE FACE OF MASSIVE REVENUE INCREASES, 2.9% ON AVERAGE.
- o MARGINS SUFFERED SUBSTANTIALLY, FALLING FROM 8.6% TO 6.1%, A DECLINE OF 28.5%.
- o AS A RESULT, CONTRIBUTIONS TO EQUITY GREW ONLY 13.9% WHILE R.O.E. FELL ALMOST 15% TO 9.3%.
- o WHILE ASSETS INCREASED A SIGNIFICANT 26.8%, RETURN ON ASSETS PLUMMETED TO ONLY 5.6% FROM THE PREVIOUS 7.3%.
- o SINCE SALES GREW FASTER THAN ASSETS, A 7.1% INCREASE IN THE S/A RATIO OCCURED WITH PUBLIC SOFTWARE COMPANIES GENERATING \$.90 IN SALES FOR EVERY DOLLAR IN ASSETS IN 1984.

INPUT

SOFTWARE (continued)

- o INDICATIVE OF THE EARNINGS "PINCH," WORKING CAPITAL INCREASED ONLY 4.4% WITH A CONCOMITANT DECAY OF THE W.C. RATIO TO .417.
- o BOOK VALUES PER SHARE MADE MODEST GAINS OF 11.6% TO \$4.53 PER SHARE.
- o MARKET TO BOOK FELL ALMOST 18% TO 3.48 WHILE P/E'S PLUMMETED TO AN AVERAGE 33.6 TIMES EARNINGS FROM A VERY "RICH" 44.9.
- o TOTAL MARKET VALUE OF THE FIRMS FELL 27.5%, A DROP NOT DISSIMILAR TO THE 23.7% SEEN IN PROCESSING. GIVEN EARNINGS PERFORMANCE OF THE TWO GROUPS, A GREATER DROP IN SOFTWARE SHOULD HAVE OCCURRED. WE MAY SPECULATE THAT EXPECTATIONS OF FUTURE EARNINGS GROWTH WERE HIGHER IN SOFTWARE THAN PROCESSING.
- o IN 1984 IT TOOK \$2.06 IN MARKET VALUE TO BUY \$1.00 IN SALES, A PRECIPITOUS DROP OF 46.6% FROM \$3.86 IN 1983.
- o COMMENTS ON VALUATION VERSUS S/P 500 APPLY HERE ALSO.

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

PROFESSIONAL SERVICES

FINANCIAL

	<u>1983</u>	<u>1984</u>	<u>%</u>
REVENUE	\$ 98,831	\$ 113,016	14.4
NET INCOME	3,161	3,905	23.6
NET MARGIN	3.2%	3.5%	8.0
EQUITY (BOOK)	34,488	40,050	16.2
R.O.E.	11.9%	12.8%	7.4
ASSETS	57,286	66,052	15.3
R.O.A.	5.5%	5.9%	7.2
SALES/ASSETS (\$)	1.73	1.71	-0.8
R.P.E.	63.846	68.410	7.1
WORKING CAPITAL	15,140	17,296	14.2
WORKING CAPITAL/REV.	.152	.153	0.7
BOOK/SHARE (\$)	5.71	5.54	-3.0

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

PROFESSIONAL SERVICES

VALUATION

	<u>1983</u>	<u>1984</u>	<u>%</u>
MARKET/BOOK	3.22	1.85	-42.5
P/E	27.1	14.5	-46.5
MARKET VALUE	85,537	56,559	-33.9
MARKET/SALES (\$)	0.87	0.50	-42.5
S/P 500 P/E	11.8	10.1	-14.4
P/E MULT	2.3	1.4	-39.1
SP 500 INDEX	164.9	167.2	+1.4

INPUT

PROFESSIONAL SERVICES COMMENTS

- o PROFESSIONAL SERVICES FIRMS EXPERIENCED A MODERATE 14.4% REVENUE INCREASE WITH A MUCH STRONGER EARNINGS GROWTH OF 23.6%.
- o MARGINS, WHILE INCREASING, REMAINED LOW AT 3.5% NET ON SALES.
- o RETURN ON EQUITY IMPROVED TO 12.8% BUT REMAINS MATERIALLY LOWER THAN ALL SECTORS SAVE SOFTWARE.
- o ASSETS INCREASED 15.3%, THE LOWEST INCREASE AMONG THE FOUR SECTORS.
- o RETURN ON ASSETS WAS 5.9%, A MODEST 7.2% INCREASE OVER 1983. HISTORICALLY, THE LOWEST R.O.A.'S ARE FOUND IN THIS SECTOR.
- o THE REVENUE GENERATING POWER OF \$1.00 IN ASSETS FELL VERY SLIGHTLY (-0.8%) TO \$1.71 WHILE EMPLOYEE PRODUCTIVITY INCREASED A STRONG 7.1% TO \$68.4K.

INPUT

PROFESSIONAL (continued)

- o WORKING CAPITAL INCREASED ON PAR WITH REVENUES WITH NO CHANGE IN THE W.C. RATIO (AS WOULD BE EXPECTED).
- o BOOK VALUE PER SHARE FELL IN THIS GROUP DUE TO GROWTH IN SHARES OUTSTANDING (ABOUT 3%) WHILE TOTAL BOOK VALUE GREW 16%.
- o P/E'S COLLAPSED, FALLING FROM 27.1 TO 14.5 IN ONE YEAR ON A 23.6% INCREASE IN EARNINGS.
- o TOTAL MARKET VALUE WAS SLICED BY 33.9% WITH A 42.5% FALL IN MARKET/BOOK RATIO FROM 3.22 TO 1.85 ALSO OCCURING.
- o THE MULTIPLIER TO THE S&P ALSO SLIPPED 39.1% FROM 2.3X TO ONLY 1.4X.
- o THIS MASSIVE DEVALUATION HAD CSC SELLING SLIGHTLY BELOW ITS BOOK VALUE AT YEAR-END DESPITE STRONG EARNINGS INCREASES.
- o OF THE FOUR SECTORS EXAMINED THIS ONE SEEMS THE MOST SENSITIVE TO DEVALUATION FOR "NON-FUNDAMENTAL" REASONS.

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

TURNKEY SYSTEMS

FINANCIAL

	1983	1984	%
REVENUE	\$ 85,383	\$ 111,694	30.8
NET INCOME	7,189.99	9,140	27.1
NET MARGIN	8.4%	8.2%	-2.8
EQUITY (BOOK)	48,695	62,407	28.2
R.O.E.	14.8%	14.6%	-0.8
ASSETS	81,495	109,157	33.2
R.O.A.	8.8%	8.4%	-4.5
SALES/ASSETS	1.04	1.02	-1.8
R.P.E.	94.821	101.499	7.7
WORKING CAPITAL	29,144	41,891	43.7
WORKING CAPITAL/REV.	.341	.375	9.9
BOOK/SHARE	4.54	5.16	13.7

INPUT

PARAMETERS OF MEAN PUBLIC SERVICES COMPANIES

TURNKEY SYSTEMS

VALUATION

	1983	1984	%
MARKET/BOOK	4.70	3.74	-20.43
P/E	31.8	25.5	-19.8
MARKET VALUE	231,590	223,520	-3.5
MARKET/SALES	2.68	2.09	-22.4
S/P 500 PE	11.8	10.1	-14.4
P/E MULT	2.7	2.5	-7.4
S/P 500 INDEX	164.9	167.2	1.4

INPUT

TURNKEY SYSTEMS COMMENTS

- o PROPELLED BY STRONG DEMAND FOR CAD/CAM SYSTEMS WHICH SUBSEQUENTLY SOFTENED, TURNKEY REVENUES GREW 30.8% IN 1984.
- o NET INCOME LAGGED ONLY SLIGHTLY, GROWING BY 27.1% WHILE MARGINS "HELD" AT 8.2%.
- o EQUITY ALSO INCREASED STRONGLY AS A CONSEQUENCE, GROWING 28%. RETURN ON EQUITY WAS ALMOST STABLE AT 14.6% IN 1984 VERSUS 14.8% IN 1983.
- o HEAVY INVESTMENT OCCURRED IN THIS SECTOR WITH A 33.2% INCREASE IN AVERAGE ASSETS. INVESTMENT EXCEEDED BOTH REVENUE AND EARNINGS GAINS.
- o AS A RESULT THE R.O.A. SLIPPED SLIGHTLY TO 8.4%, AS DID THE S.A. RATIO TO \$1.02 FROM \$1.04.

INPUT

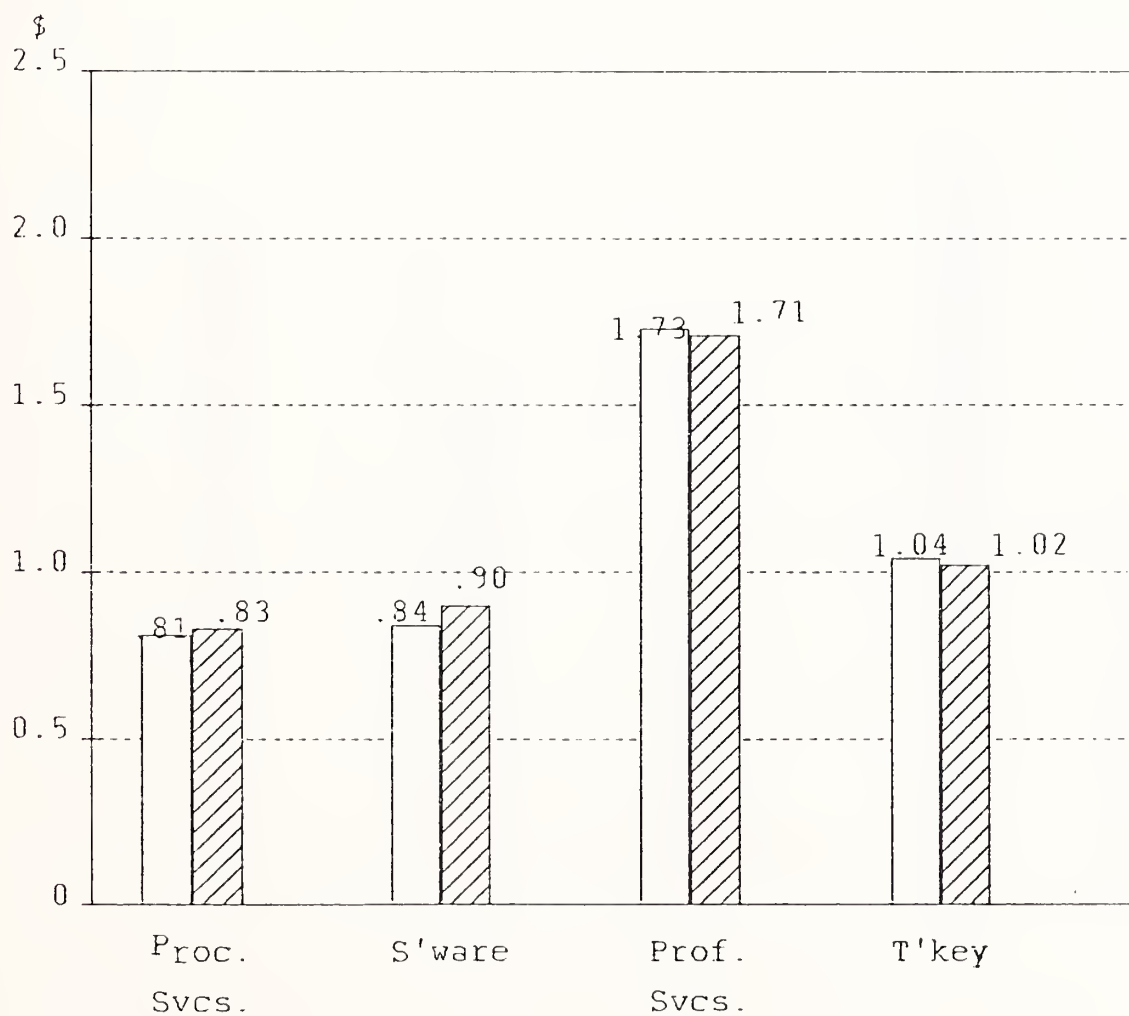
TURNKEY (continued)

- o REVENUE PER EMPLOYEE INCREASED A STRONG 7.7% WHICH MAY ONLY INDICATE AN INABILITY TO RECRUIT AS RAPIDLY AS SALES DEMAND WAS RISING.
- o THERE WAS ALSO AN IMPROVEMENT IN LIQUIDITY WITH THE W.C. RATIO INCREASING 9.9%.
- o BOOK VALUE PER SHARE INCREASE DID NOT KEEP PACE WITH BOOK VALUE DUE TO INCREASED SHARES. GROWTH WAS 13.7%.
- o THIS SECTOR WAS LEAST IMPACTED BY FALLING VALUATIONS DURING THE STUDY TIME FRAME.
- o P/E'S DECLINED A "MODERATE" 19.8% WITH THE S&P MULTIPLIER SLIPPING ONLY 7.4% FROM 2.7 to 2.5.
- o TOTAL MARKET VALUE DECLINED ONLY MODESTLY, ABOUT 3.5% WHILE A DOLLAR'S WORTH OF SALES WHICH COST 2.68 IN THE MARKET IN 1983 COULD BE HAD FOR 2.09 IN 1984, A REDUCTION OF 22.1%.

INPUT

\$ SALES PER \$ ASSETS

(Four Sectors, 1983-1984)

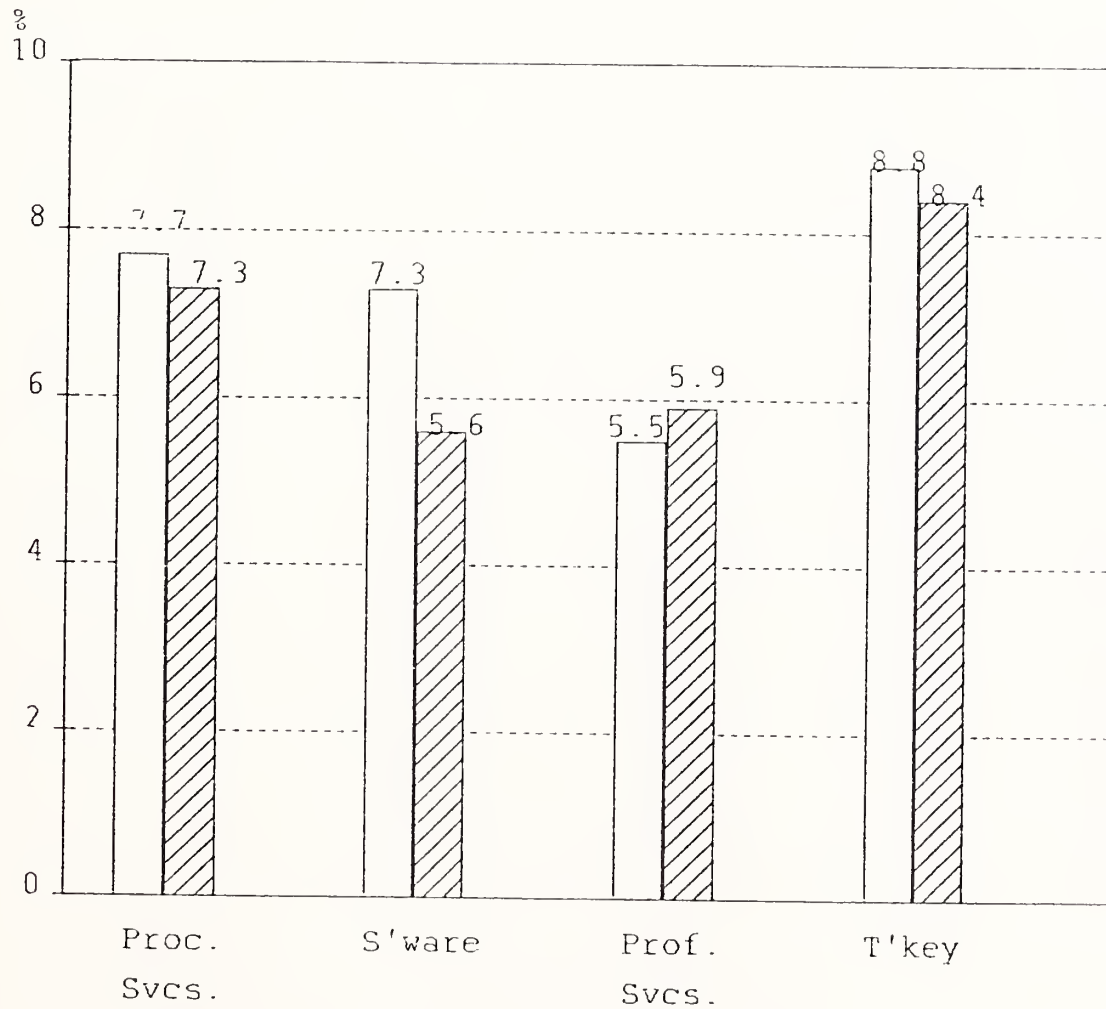


Note: Data are for public companies on a fiscal year basis.

INPUT

AVG. RETURN ON TOTAL ASSETS

(Four Sectors, 1983-1984)

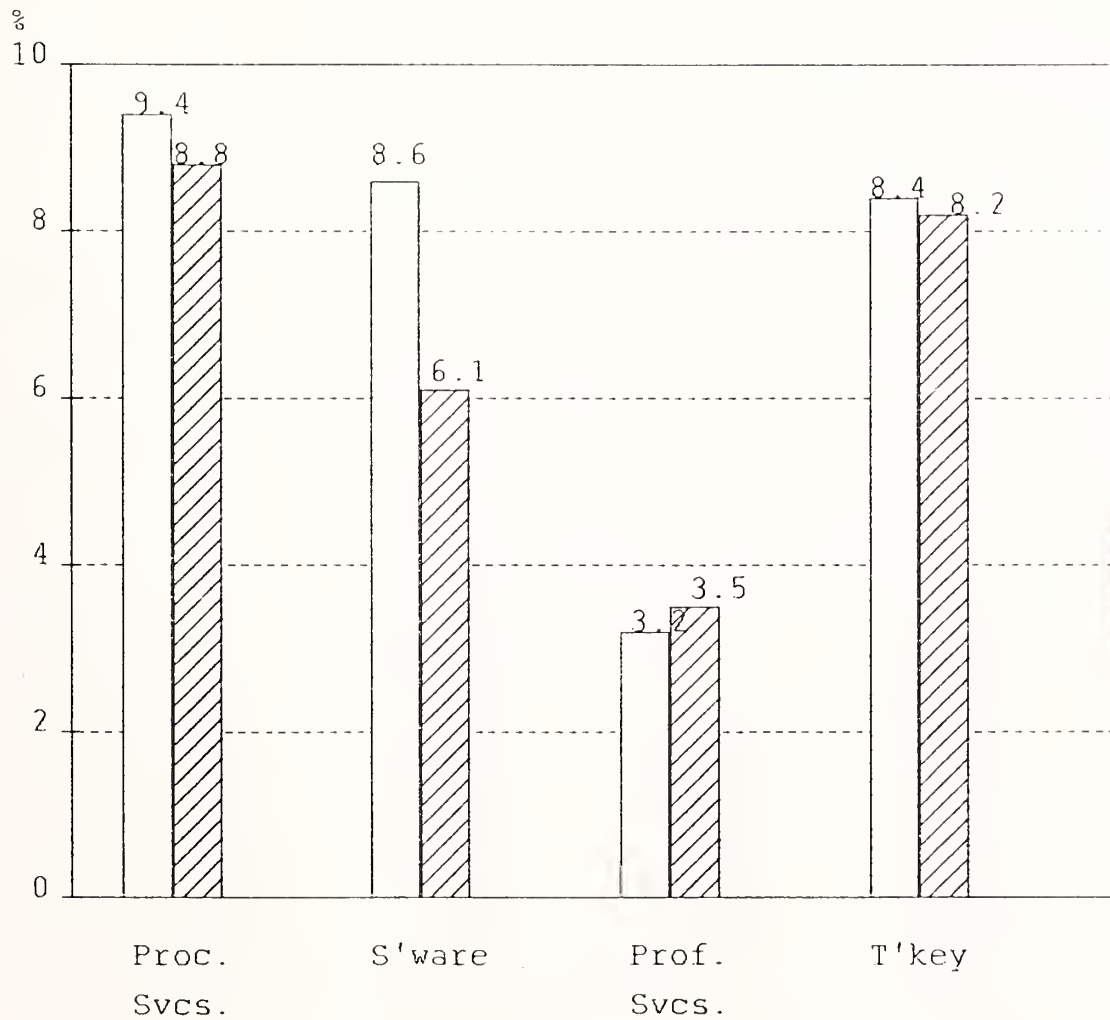


Note: Data are for public companies on a fiscal year basis.

INPUT

AVERAGE NET MARGINS

(Four Sectors, 1983-1984)

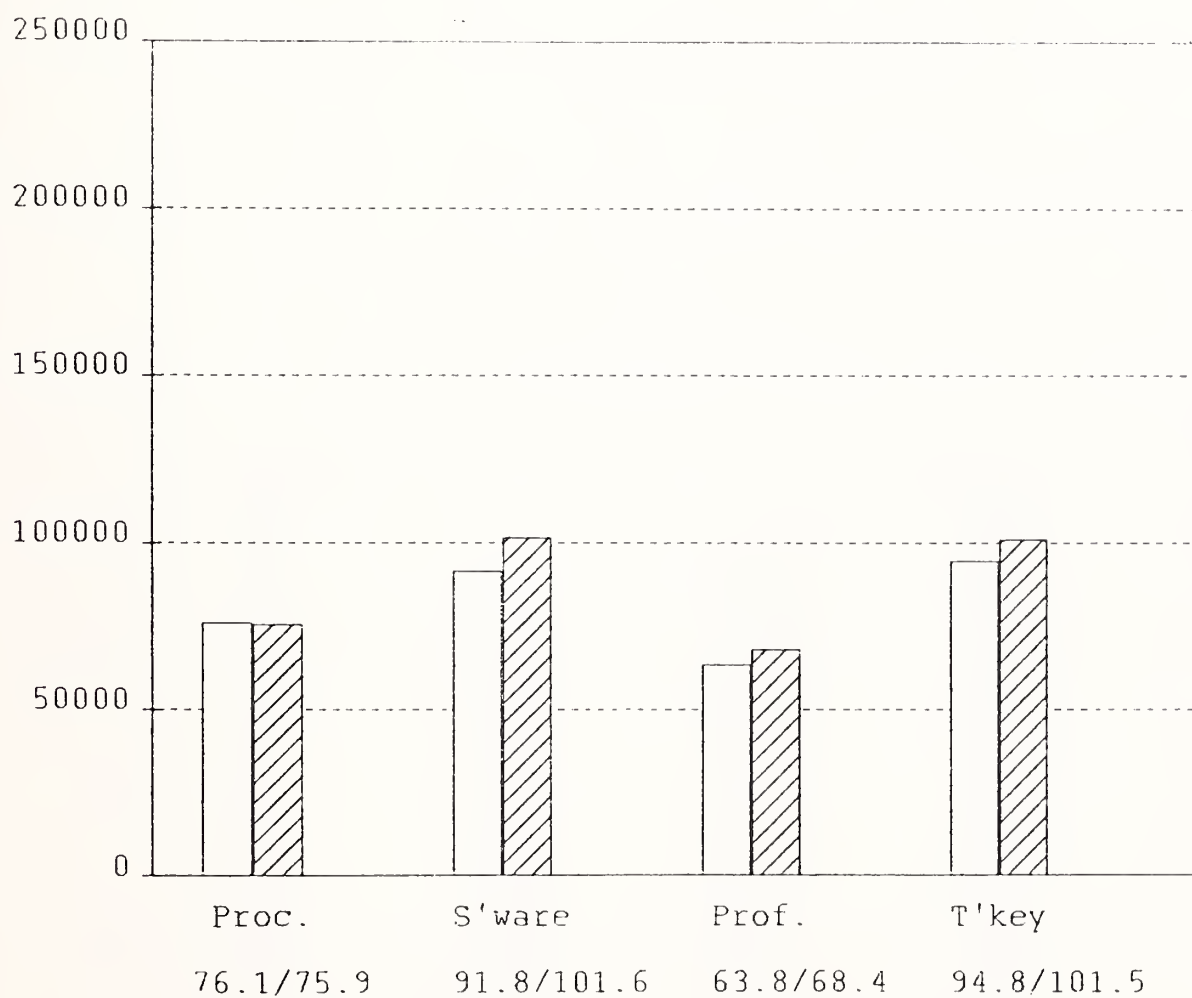


Note: Data are for public companies on a fiscal year basis.

INPUT

AVERAGE REVENUE PER EMPLOYEE

(Four Sectors, 1983-1984)



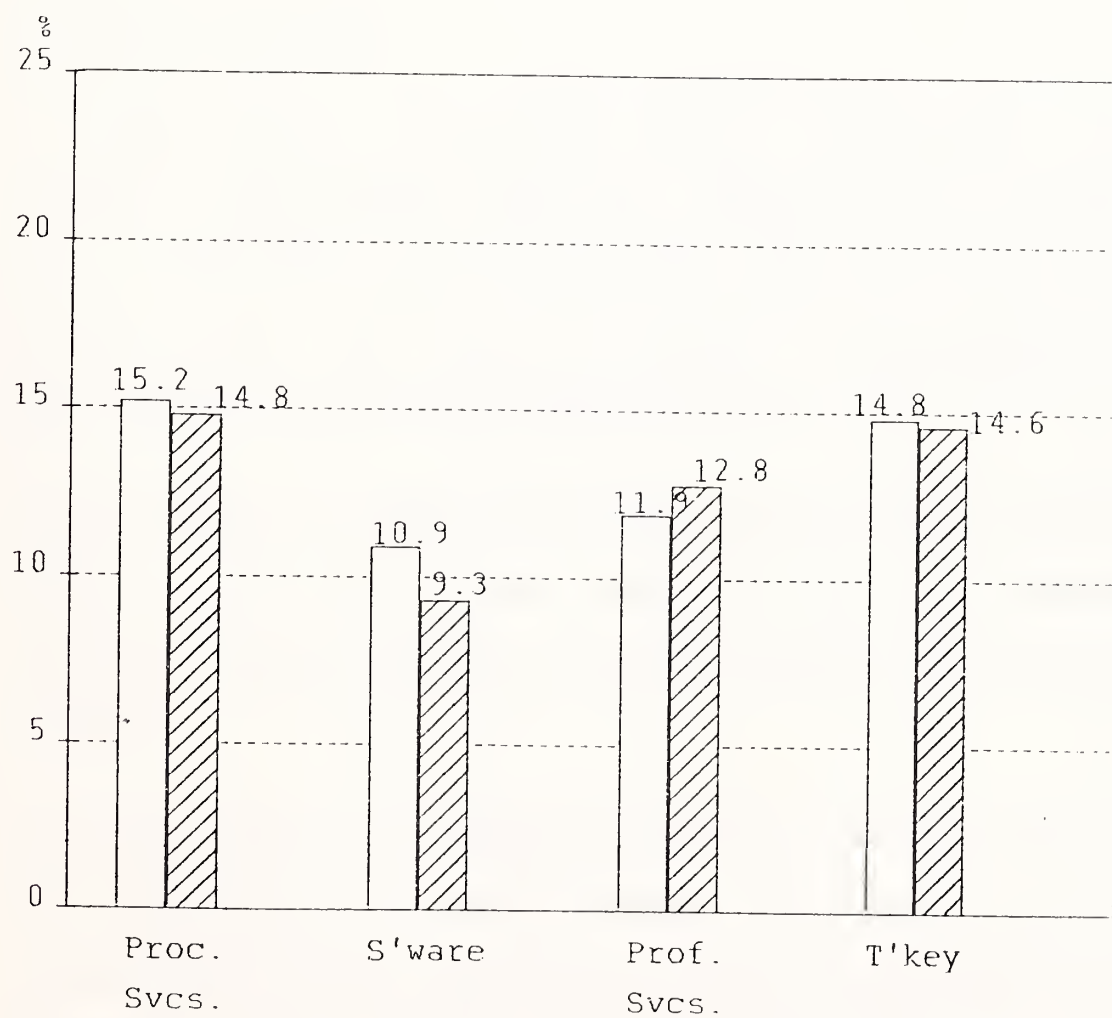
Note: Data are for public companies on a fiscal year basis.

Values are in \$000's.

INPUT

AVG. RETURN ON EQUITY

(Four Sectors, 1983-1984)



Note: Data are for public companies on a fiscal year basis.

INPUT

SECTOR COMPARISON

- o GTEDS MAY USE THE CHARACTERISTIC FINANCIAL PERFORMANCE OF A SECTOR IN CONJUNCTION WITH ITS ACQUISITION OBJECTIVES. EXAMPLES FOLLOW.
- o IF GTEDS WISHES TO OPTIMIZE REVENUE GENERATION FROM ASSETS A PROFESSIONAL SERVICES ORIENTATION IS DESIRABLE. P.S. GENERATES \$1.71 IN REVENUES FROM EACH DOLLAR IN ASSETS, MORE THAN TWICE THE RATES OF PROCESSING AND SOFTWARE AND 68% HIGHER THAN TURNKEY.
- o PROFITABILITY IS LOWER HOWEVER AND THE RETURN ON TOTAL ASSETS IS 5.9%. IT IS HIGHER HOWEVER THAN THE TELEPHONE INDUSTRY (ABOUT 5%) AND MATERIALLY HIGHER THAN GTE (3.9% IN 1983).
- o IF GTEDS WISHES TO MAXIMIZE EARNINGS IT SHOULD FOCUS ON PROCESSING SERVICES WHERE MARGINS ARE HIGHEST AND VERY IMPORTANTLY MORE STABLE DUE TO THE RECURRING NATURE OF REVENUES, WHILE TURNKEY SYSTEMS MIGHT SEEM A LOGICAL SECOND CHOICE UNDER THE CRITERION, MARGINS HAVE DECAYED SUBSTANTIALLY IN 1985 IN THE TURNKEY SECTOR.

INPUT

SECTOR COMPARISON (continued)

- o IF GTEDS SEEKS MAXIMUM REVENUE FROM A SMALLER STAFF, SOFTWARE IS A LOGICAL EMPHASIS WITH REVENUES PER EMPLOYEE 34% HIGHER THAN PROCESSING AND 49% HIGHER THAN PROFESSIONAL SERVICES.
- o FROM A RETURN OF EQUITY STANDPOINT SOFTWARE IS CLEARLY SUB-STANDARD. IN COMPARING R.O.E.'S TO TELEPHONE OPERATIONS IT MUST BE REMEMBERED THAT TELCO'S CARRY VERY SUBSTANTIAL DEBT WHILE C.S. COMPANIES HAVE NEGLIGABLE DEBT.

INPUT

A LOOK AT 1985

- o THE FOLLOWING DATA EXAMINES THE FOUR SECTORS' PERFORMANCE ON A QUARTERLY BASIS INTO 1985. WHILE THERE IS MUCH POSITIVE ABOUT THE INDUSTRY AND FORECAST GROWTH REMAINS STRONG BUT REDUCED FROM FORMER LEVELS, RECENT RESULTS TEMPER HISTORICAL HIGH ENTHUSIASM.

INPUT

EARNINGS AND REVENUE CHANGES

PUBLIC COMPANIES

1983 to 1984

REVENUE	+25.5%
EARNINGS	+22.2%
MARGIN	7.0%

Q1 84 to Q1 85

REVENUE	+16.4%
EARNINGS	-17.7%
MARGIN	5.4%

Q2 84 to Q2 85

REVENUE	+14.5%
EARNINGS	-14.0%
MARGIN	5.3%

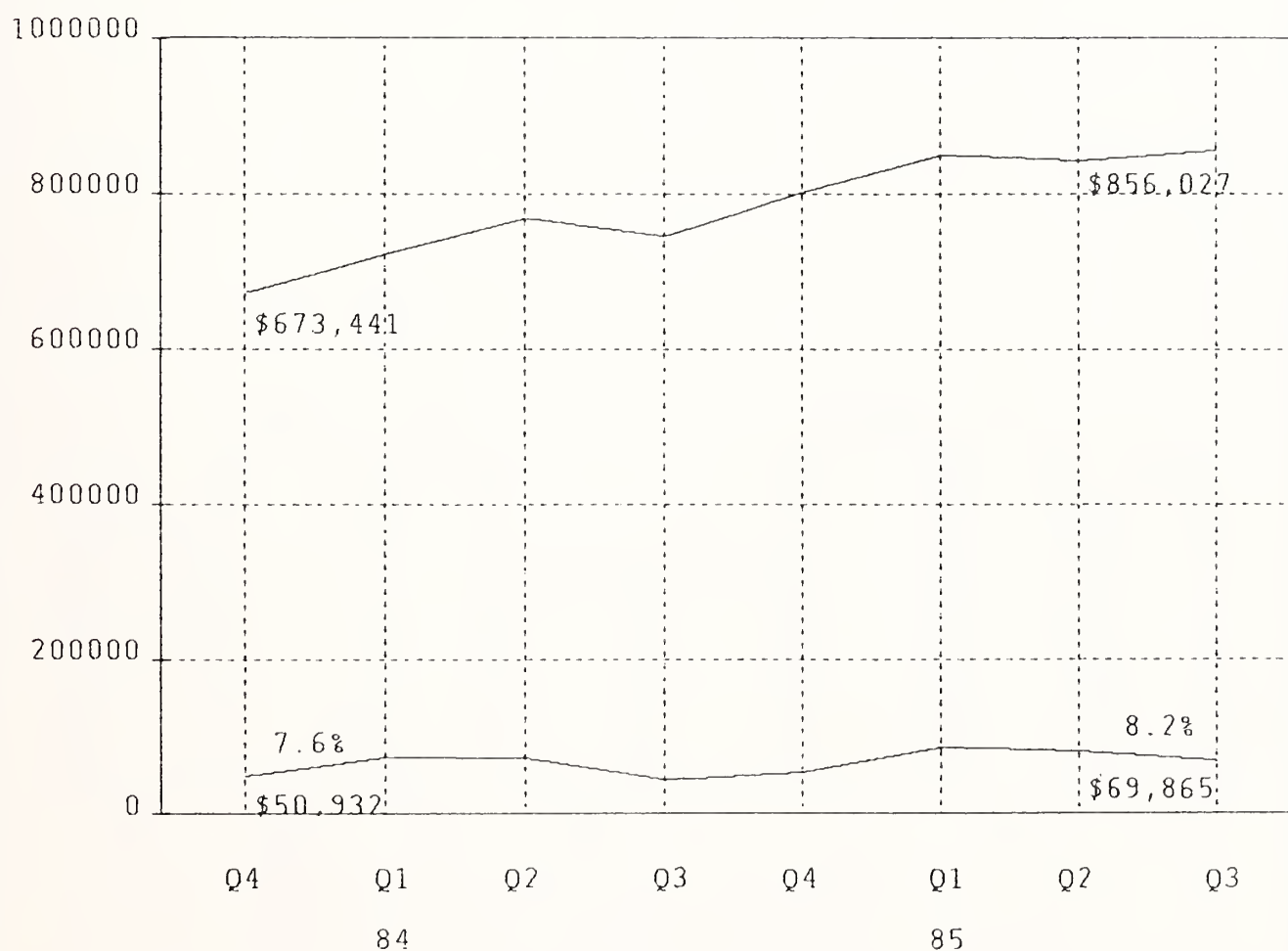
Q3 84 to Q3 85

REVENUE	+13.3%
EARNINGS	-12.0%
MARGIN	4.9%

INPUT

PROCESSING QUARTERLY RESULTS

Q4 1983 THRU Q3 1985

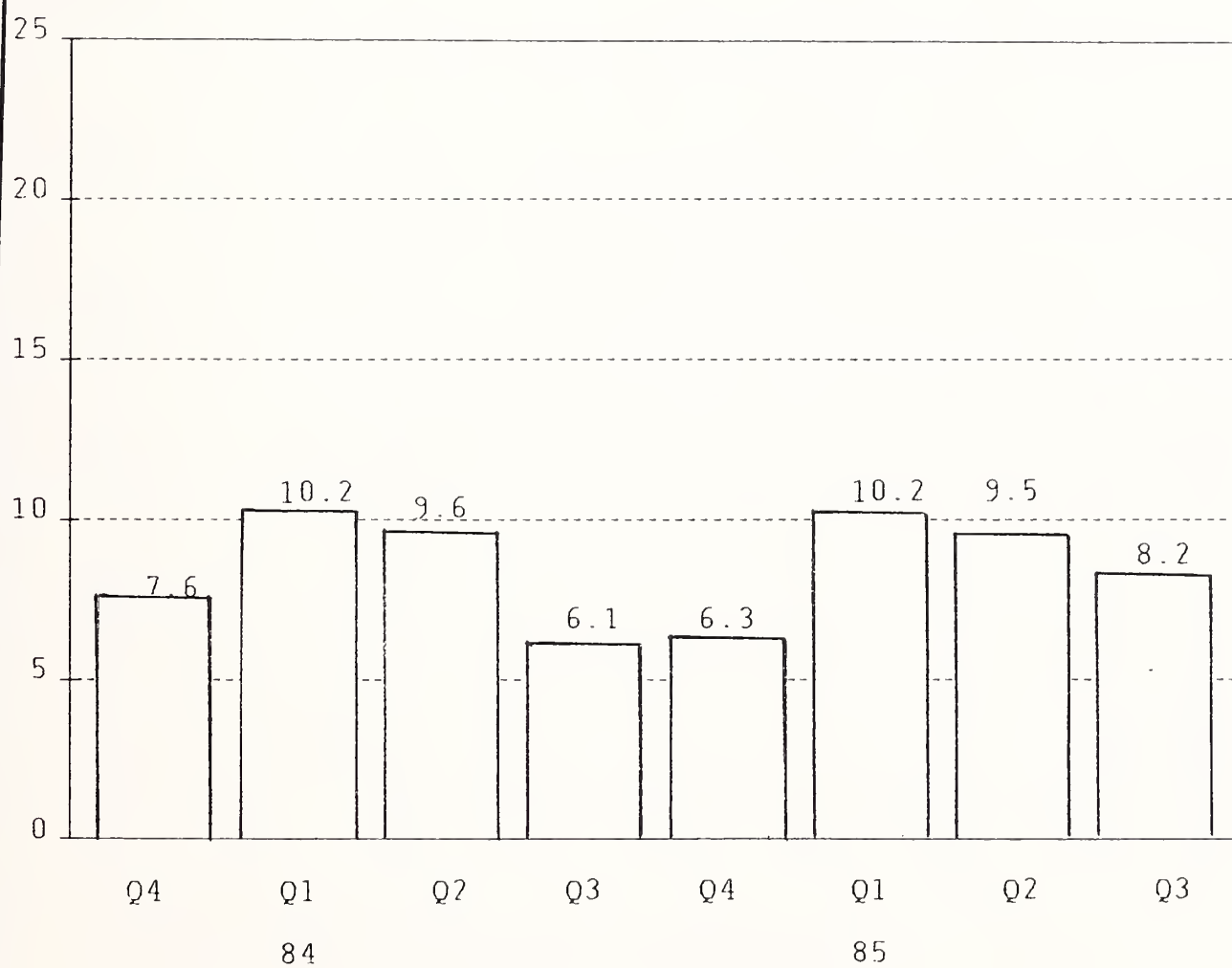


Notes: 000 omitted; upper line revenue; lower line net earnings

INPUT

PROC. QTRLY. NET MARGINS

Q4 1983 THRU Q3 1985

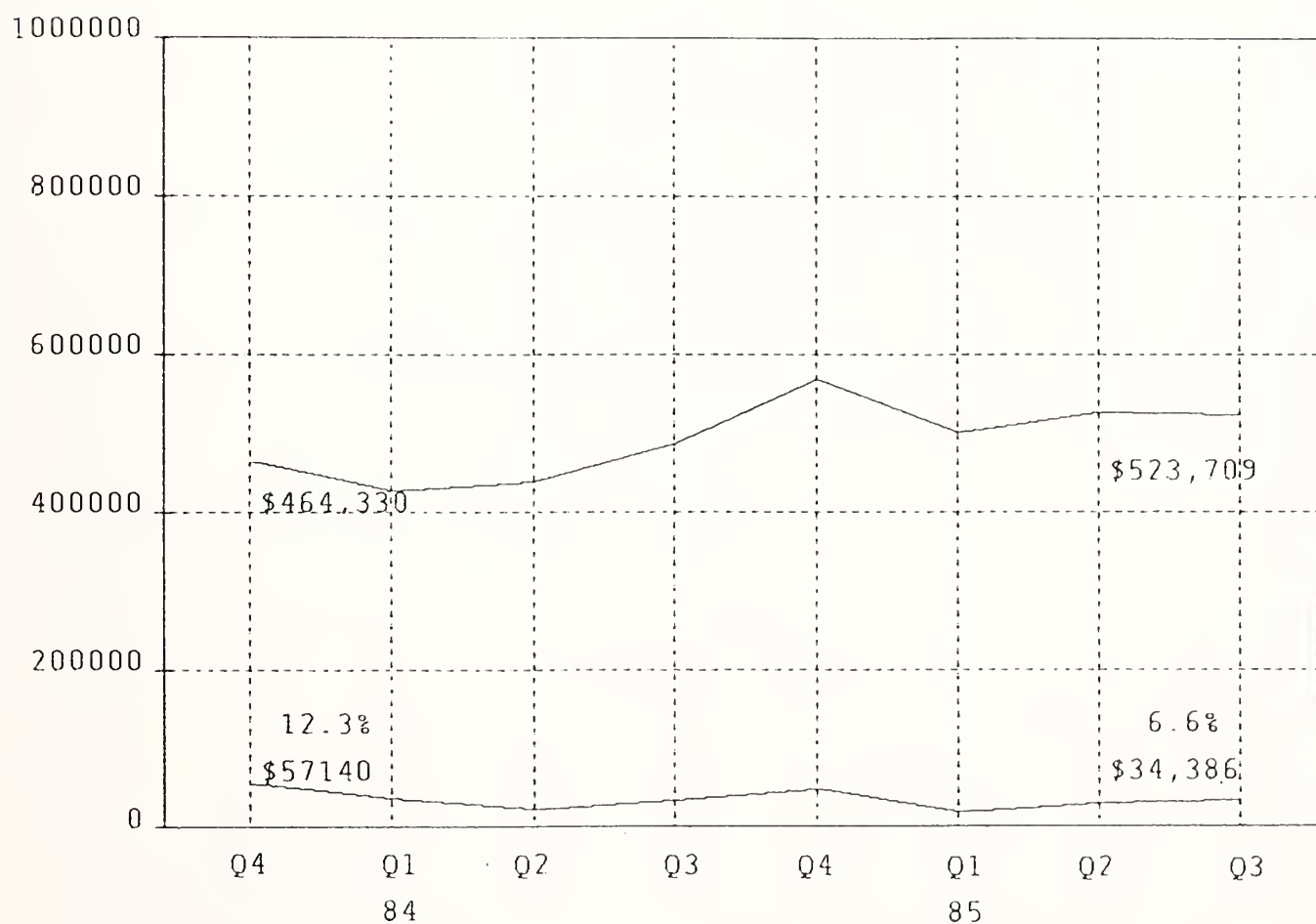


Mean=8.45%;SD=1.67%

INPUT

SOFTWARE QUARTERLY RESULTS

Q4 1983 THRU Q3 1985

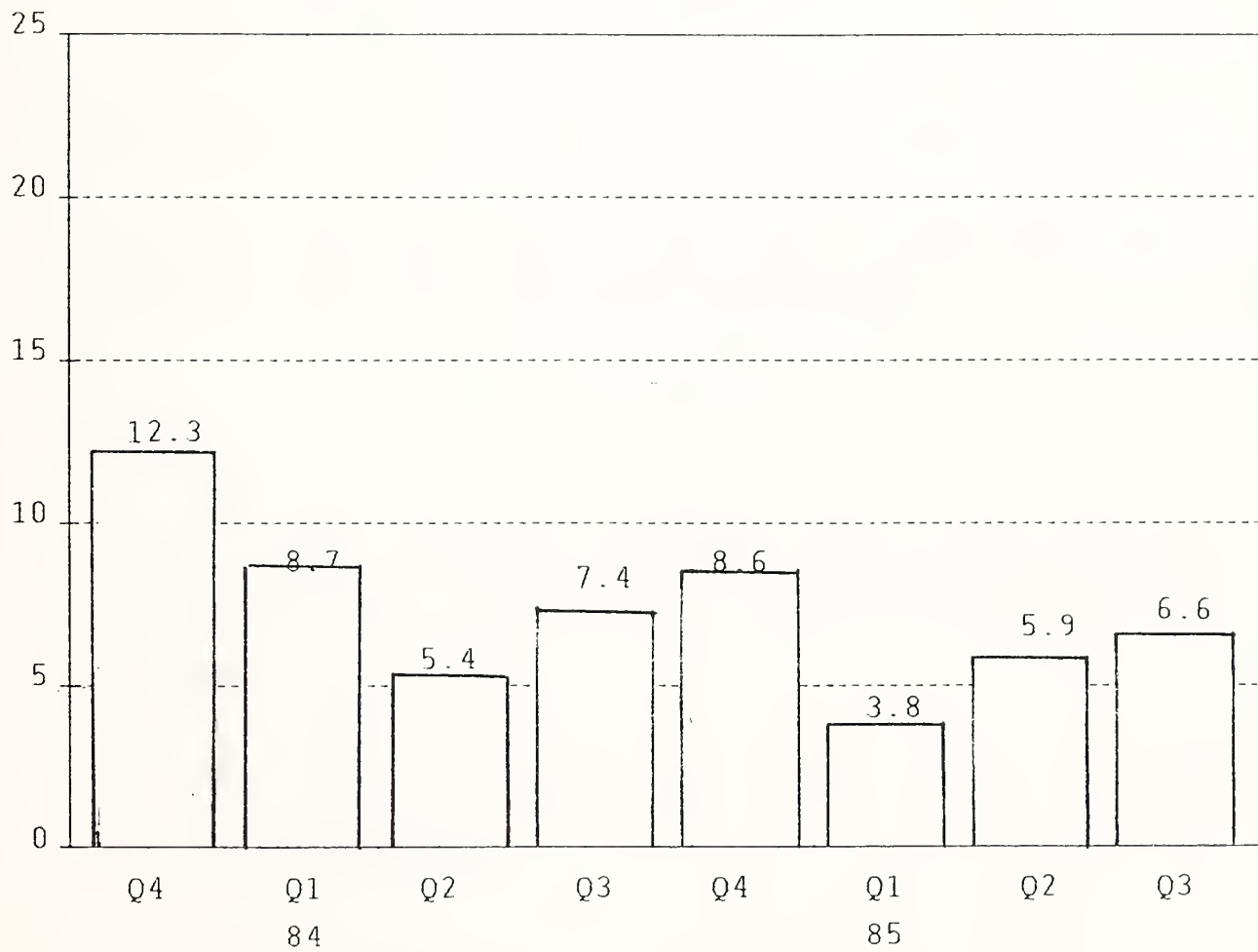


Notes: Same conventions as Processing.

INPUT

S 'WARE QTRLY. NET MARGINS

Q4 1983 THRU Q3 1985



Mean=7.34%; SD=2.54%

INPUT

QUARTERLY COMMENTS

PROCESSING

- o POINT-TO-POINT (8 QUARTERS) REVENUES INCREASED 27.1% WHILE EARNINGS GREW 37.2% FOR THESE COMPANIES. A DROP IN REVENUES AND EARNINGS IS CLEARLY DISCERNABLE IN LATE 1984.
- o MARGINS AVERAGED 8.45% DURING THE PERIOD WITH SOME SEASONAL EFFECTS BUT NO TREND DISCERNABLE.

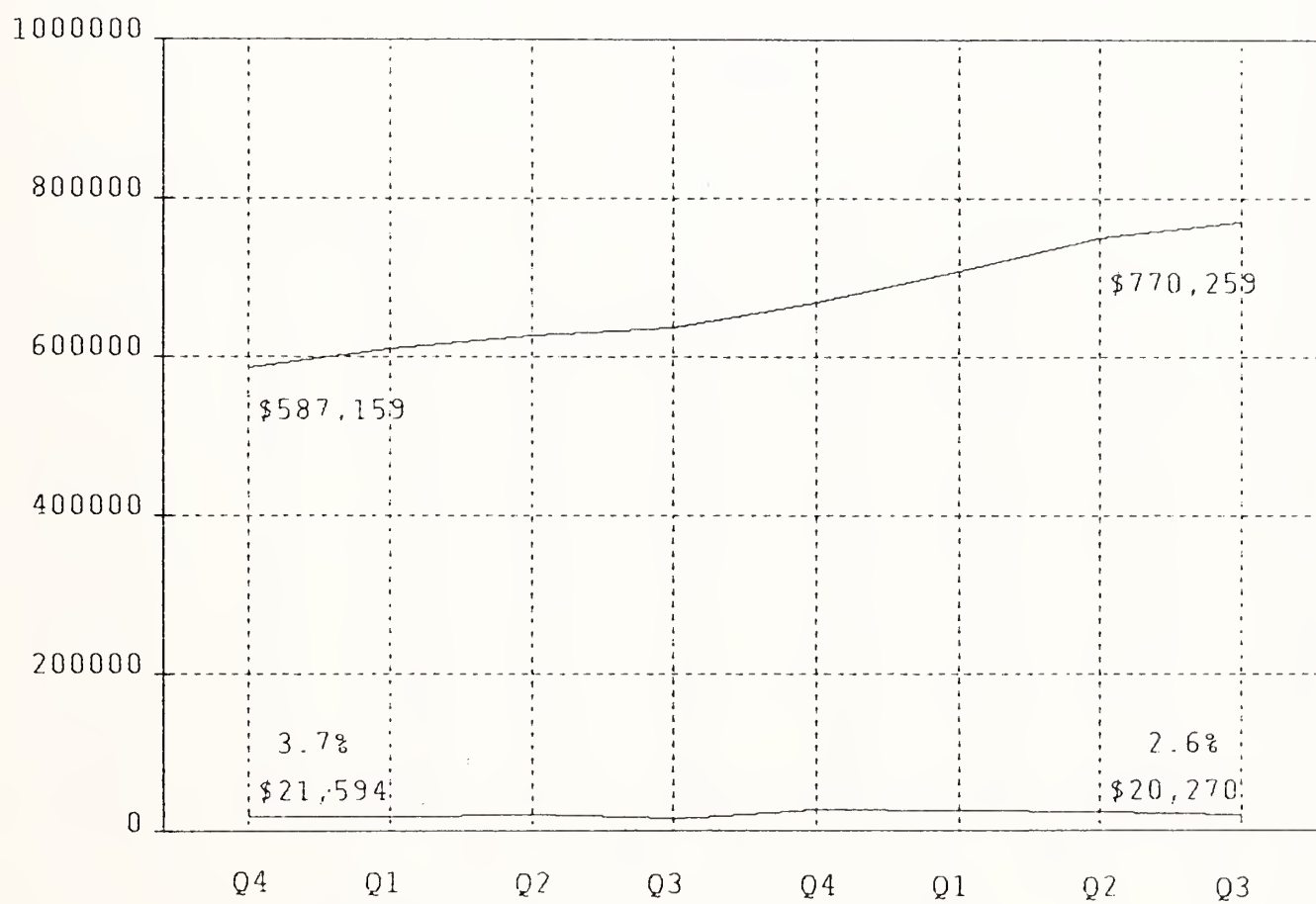
SOFTWARE

- o POINT-TO-POINT REVENUES INCREASED ONLY 12.8% AND HAVE NOT RECOVERED TO Q4 1984 HIGHS. EARNINGS DURING THE SAME INTERVAL ARE OFF 39.2%.
- o MARGINS ARE VOLATILE ABOUT WHAT APPEARS TO BE A DISTINCT DOWNWARD PRESSURE.

INPUT

PRO. SVC. QUARTERLY RESULTS

Q4 1983 THRU Q3 1985

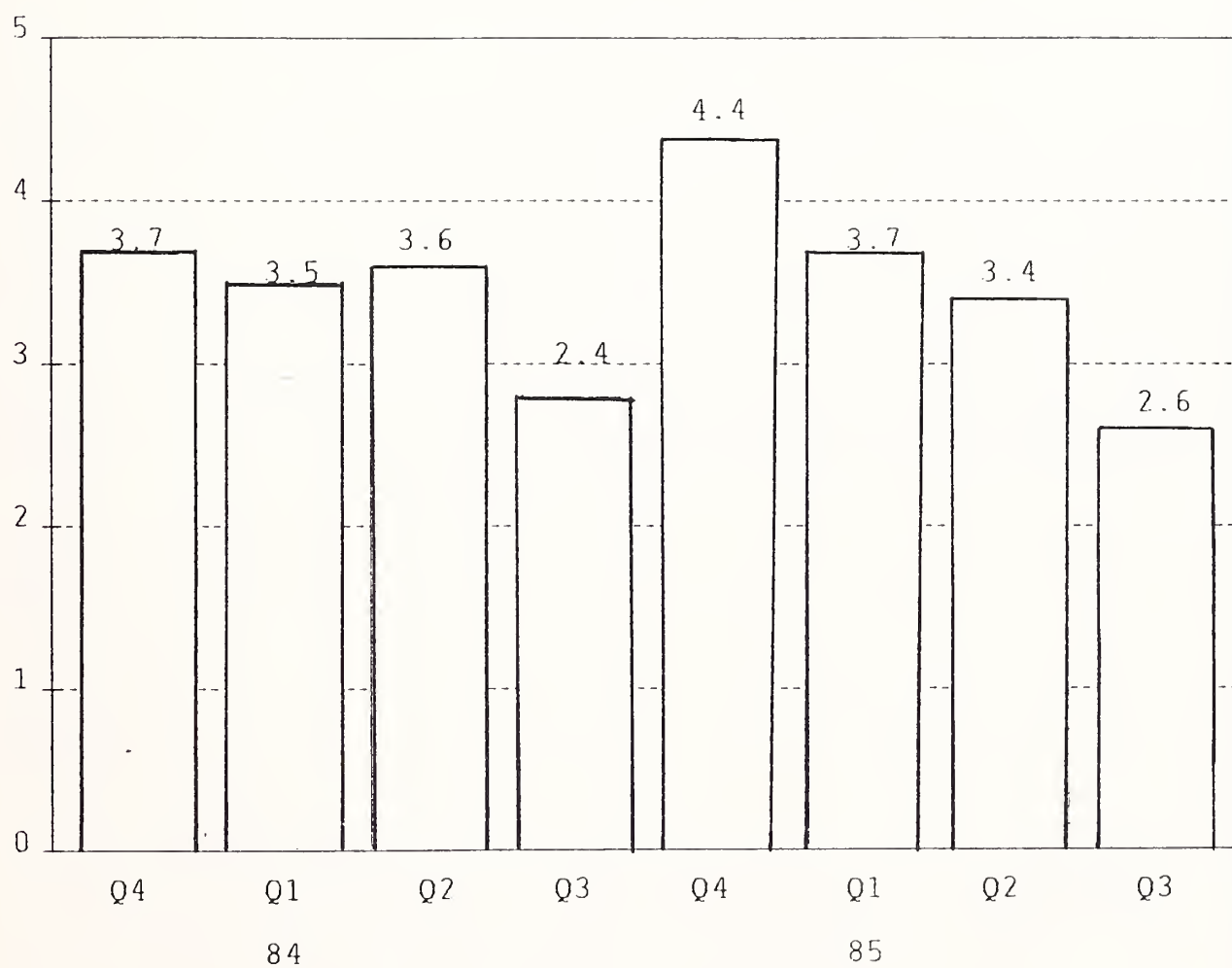


Notes: Conventions same as Processing.

INPUT

P. SVC. QTRLY NET MARGINS

Q4 1983 THRU Q3 1985

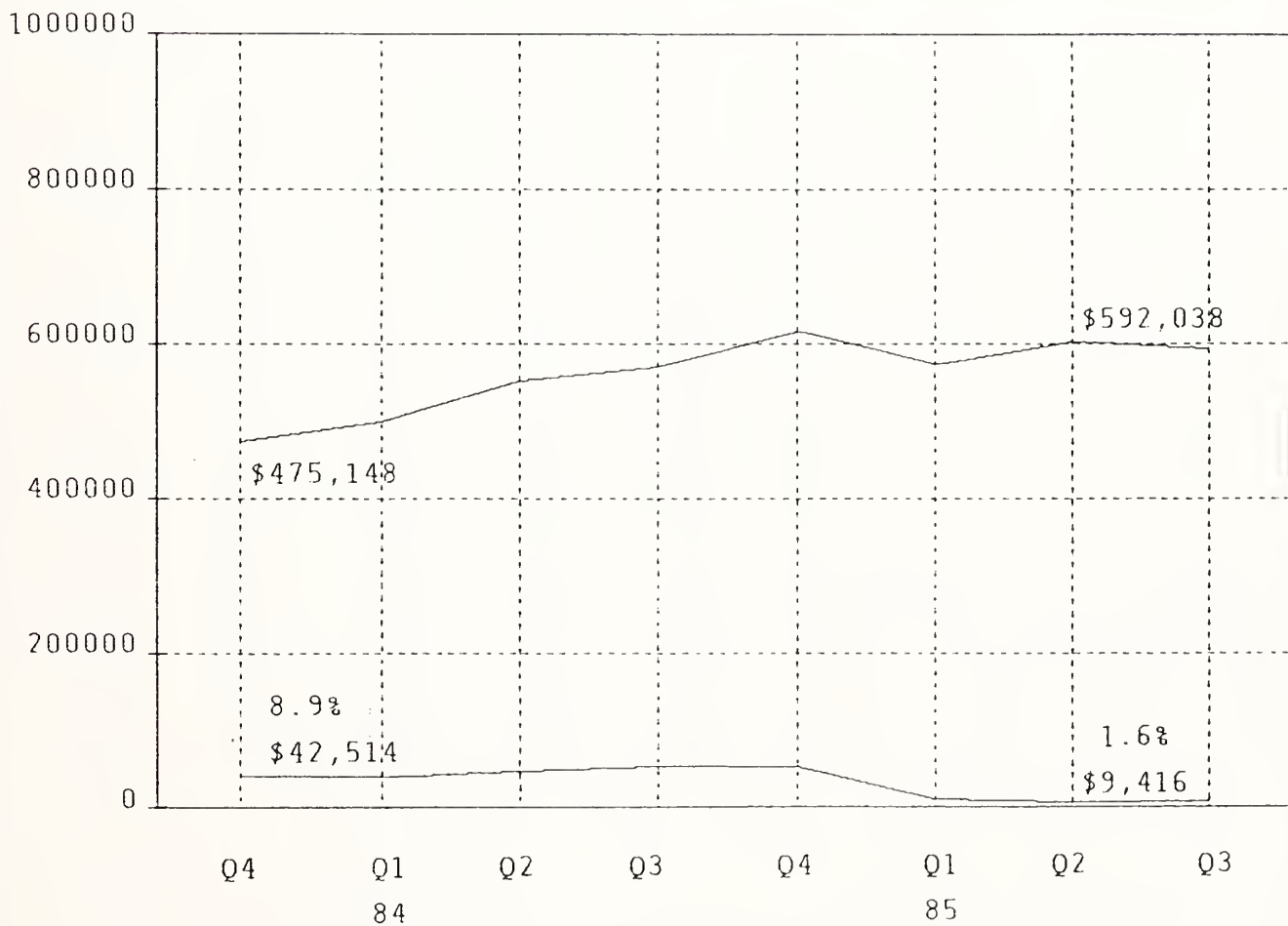


Mean=3.46%;SD=0.56% NOTE DIFFERENT SCALE

INPUT

TURNKEY QUARTERLY RESULTS

Q4 1983 THRU Q3 1985

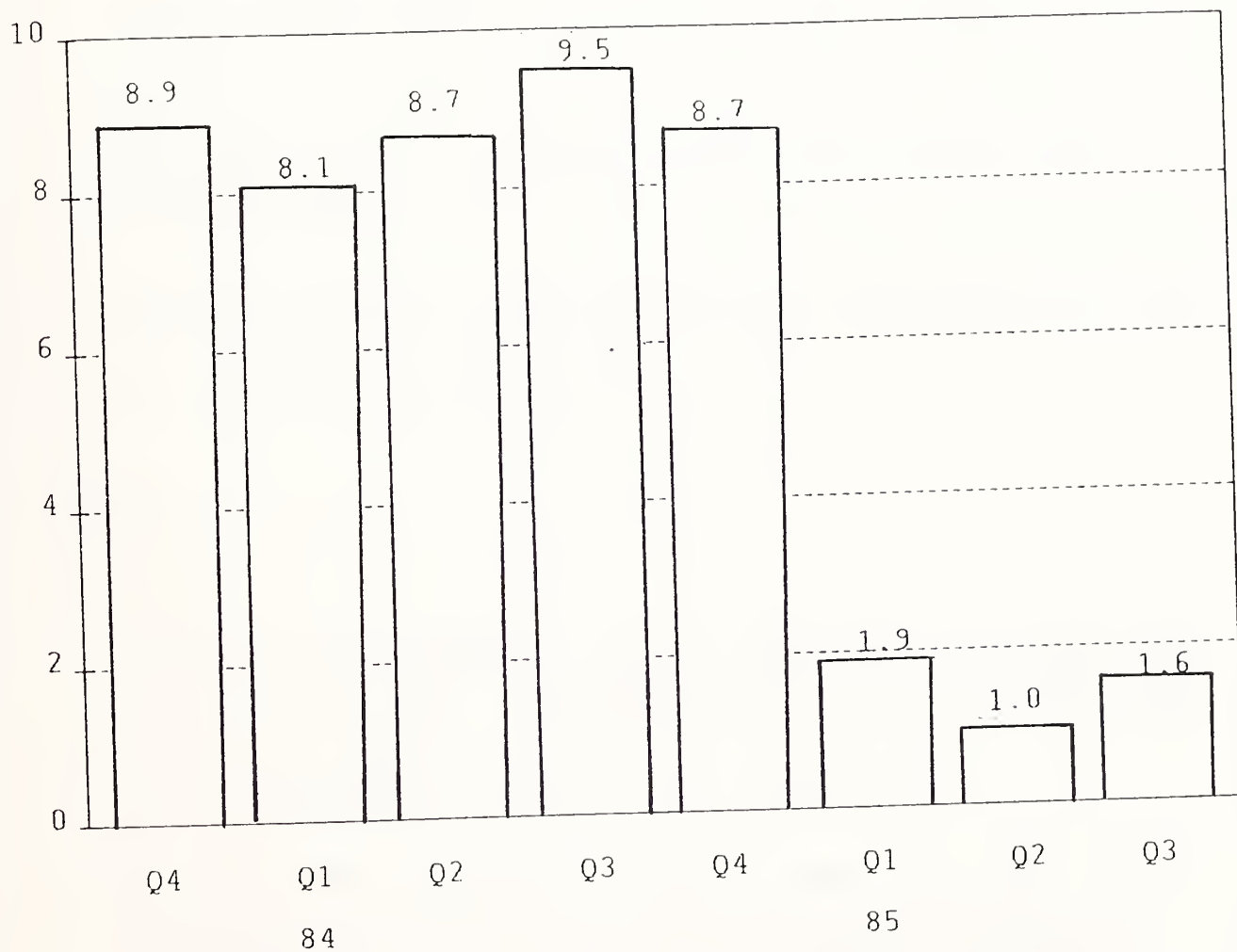


Notes: Conventions same as Processing.

INPUT

TKY QTRLY. NET MARGINS

Q4 1983 THRU Q3 1985



Mean=6.05%; SD=3.79%. NOTE DIFFERENT SCALE

INPUT

PROFESSIONAL SERVICES

- o POINT-TO-POINT REVENUE GROWTH IS THE STRONGEST AND SMOOTHEST OF THE FOUR GROUPS CLIMBING 31.2%. EARNINGS ARE ESSENTIALLY FLAT WHICH MEANS MARGINS ARE DOWN. PTP EARNINGS ARE OFF 6.1%.
- o MARGINS ARE LOW, AVERAGING 3.46% FOR THE PERIOD AND ARE IN A YEAR-LONG DOWNTREND.

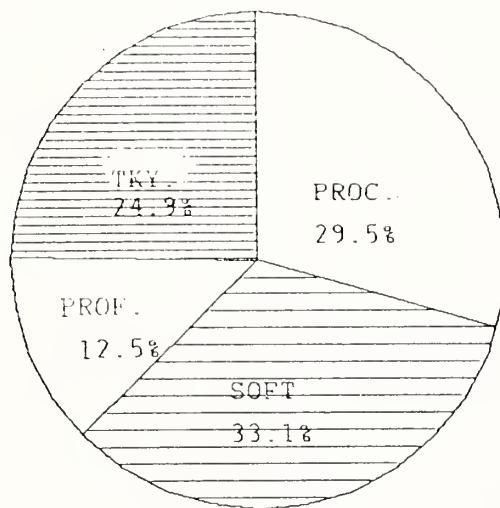
TURNKEY

- o POINT-TO-POINT REVENUES ARE UP 24.6% WHILE EARNINGS ARE OFF A MASSIVE 77.9%. NEITHER REVENUES NOR EARNINGS HAVE EXCEED Q4 84 HIGHS. MARGINS HAVE COLLAPSED.
- o MARGINS WERE RELATIVELY STABLE UNTIL 1985 WHEN THEY SHRANK DRAMATICALLY WITH NO SIGN OF RECOVERY IN SIGHT.

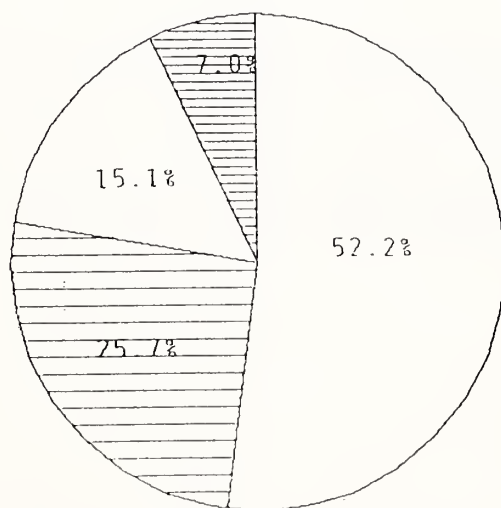
INPUT

EARNINGS SHARE COMPARISON

Q4 83 vs. Q3 85



\$172,180



\$133,937

Note: Charts show share of total net earnings by delivery mode.
000 omitted. Observe decrement in total earnings for 110 public companies.

INPUT

EARNINGS COMMENTS

- o NOTE THAT IN THIS 8 QUARTER SPREAD COMPARISON, TOTAL EARNINGS FOR THE UNIVERSE OF COMPANIES IS DOWN 22.2%.
- o ALSO NOTE THE RADICAL SHIFT IN SHARE. THIS IS CAUSED MAINLY BY THE EARNINGS COLLAPSE IN TURNKEY. THESE FELL 82% IN THE FIRST 3 QUARTERS OF 1985 VS 1984. DURING THE SAME PERIOD SOFTWARE EARNINGS FELL 12.0%.
- o THIS PHENOMENON EMPHASIZES THE IMPORTANCE OF INDIVIDUAL COMPANY ANALYSIS. EACH SECTOR HAS ITS "WINNERS" BUT THERE ARE FEWER THAN THERE ONCE WERE.

INPUT

RELATIVE VALUE

- o IT IS OBVIOUS THAT A KEY ASPECT OF THE ACQUISITION ACTIVITY IS THE VALUE OF A COMPANY. IN CLASSICAL INVESTMENT THEORY THIS IS CLOSELY RELATED TO THE FUTURE EARNINGS STREAM. VALUATION METHODOLOGIES CAN BE EXTREMELY COMPLEX. AS A USEFUL RULE OF THUMB FOR PRELIMINARY ASSESSMENTS, THE FOLLOWING IS SUGGESTED:

$$VI = \frac{(RG + EG + MAR)}{P/E}$$

WHERE: VI IS VALUE INDEX

RG IS REVENUE GROWTH IN %

EG IS EARNINGS GROWTH IN %

MAR IS NET MARGIN IN %

P/E IS PRICE/EARNINGS

INPUT

RELATIVE VALUE (continued)

AS THE VI INCREASES WE HAVE INCREASING "GOODNESS"

1984 MEAN VI'S

<u>INDUSTRY</u>	<u>RG</u>	<u>EG</u>	<u>MAR</u>	<u>SUM</u>	<u>P/E</u>	<u>VI</u>
PROC.	19.9	12	8.8	40.7	18.5	2.17
SWARE	35.8	-2.9	6.1	39.0	33.6	1.16
P. SVC	14.4	23.6	3.5	41.5	14.5	2.86
TKY	<u>30.8</u>	<u>27.1</u>	<u>8.2</u>	<u>66.1</u>	<u>25.5</u>	<u>2.59</u>
ALL	100.9	59.8	26.6	187.3	92.1	2.03

- o THESE DATA WOULD SUGGEST THAT SOFTWARE COMPANIES WERE RATHER "OVERVALUED" WHILE PROFESSIONAL SERVICE COMPANIES WERE "UNDER VALUED" BASED ON ACTUAL FINANCIAL PERFORMANCE IN THE PRIOR YEAR.

INPUT

RELATIVE VALUE (continued)

SELECTED COMPANY VI'S

	<u>SUM</u>	<u>P/E</u>	<u>VI</u>
ADP	41.3	15.8	2.61
SHARED MEDICAL	58.8	19.6	3.00
F.D.R.	80.9	17.5	4.62
QUOTRON	49.4	10.5	4.84
TELERATE	78.6	21.4	3.67
SEI	-19.5	35.9	-0.54
TELECREDIT	-5.3	30.5	-0.17
ALL PROC. COS.	40.7	18.5	2.20

- o ON THIS MEASURE (AND AT THAT TIME) QUOTRON AND F.D.R. (FIRST DATA RESOURCES) SHOWED PARTICULARLY HIGH VI'S. THIS WOULD SUGGEST FURTHER REVIEW OF THESE COMPANIES.

INPUT

RELATIVE VALUE (continued)

- o SEI & TELECREDIT - THOUGH AWARDED SUBSTANTIAL MULTIPLES - DO NOT APPEAR TO OFFER VERY GOOD VI'S. BOTH EXPERIENCED MASSIVE DROPS IN EARNINGS BUT REMAINED PROFITABLE.
- o THIS TECHNIQUE PERMITS A SIMPLE, FAST AND STRAIGHT-FORWARD WAY TO ASSESS MARKET VALUATIONS (OR ASKING PRICES) IN THE CONTEXT OF SPECIFIC RECENT PERFORMANCE. IT SHOULD BE EMPLOYED IN THE CONTEXT OF COMPANY KNOWLEDGE AND WITH MORE DETAILED ANALYSIS WHENEVER POSSIBLE.

INPUT

TWO RECENT MAJOR TRANSACTIONS

	<u>ADR AMERITECH</u>	<u>ACI U.S. WEST</u>
PURCHASE PR.	\$ 215,000	\$ 120,000
12 MONTH REVENUE	148,348	28,448
12 MONTH NET	2,781	3,494
NET MARGIN	1.87%	12.28%
TRADING	20/SHARE	17/SHARE
OFFER	32/SHARE	27/SHARE
PREMIUM	60.00%	59.00%
BUY P/E	77.3	34.6
REVENUE MULTIPLIER	1.45	4.25
RECENT FY BOOK	59,851	21,742
BOOK MULTIPLIER	3.6	5.5
RECENT ASSETS	115,007	31,535
ASSETS MULTIPLIER	1.87	3.81

NOTE: DOLLAR VALUES (EXCEPT SHARE PRICE) ARE \$000

INPUT

TRANSACTION COMMENTARY

- o NOTE THAT IN THESE TWO RECENT MAJOR ACQUISITIONS BY RBOC'S THAT VERY SUBSTANTIAL PREMIA WERE PAID TO THE MARKET, BOTH ABOUT 60%.
- o PRIOR TO INCURRING SERIOUS LOSSES IN Q2 85, ADR HAD BEEN A RAPIDLY GROWING SYSTEMS SOFTWARE COMPANY WITH A STRONG POSITION IN UTILITIES, DBMS'S AND 4GL'S. DIFFICULTIES WERE ENCOUNTERED WHEN IBM ANNOUNCED A CREDIBLE RELATIONAL DB AND "IDEAL," THE ADR 4GL, ENCOUNTERED WELL-PUBLICIZED PERFORMANCE PROBLEMS RELATED TO TRANSACTION RATES. THESE FACTORS - COMPOUNDED BY SLOWING GROWTH IN OVERALL SOFTWARE SALES - PUSHED THE COMPANY INTO WEAKENED PERFORMANCE. EARNINGS HAD ALWAYS POSSESSED CONSIDERABLE VOLATILITY.
- o THE RATIONAL BUSINESS PURPOSE MOTIVATING THE ACQUISITION REMAINS OPAQUE. IN MARCH '86 AN OFFICER OF THE COMPANY COMMENTED "IT'S TOO EARLY TO TELL IF THERE IS ANY SYNERGY" BETWEEN AMERITECH & ADR.

INPUT

TRANSACTION (continued)

- o THE PROBLEMS EXISTING IN 1985 REMAIN IN 1986 AND IT SEEMS UNLIKELY THAT ADR WILL OVERCOME THEM IN THE NEAR FUTURE. ADR WOULD HAVE CONTRIBUTED 2.8¢ PER SHARE IN 1985 ON THE COMPANY'S \$11.02/SHARE EARNINGS. THE ACQUISITION REPRESENTS 8.8. DAYS OF AMERITECH'S TOTAL 1985 REVENUES. CASH ACQUISITION.
- o THE RECENTLY ANNOUNCED PURCHASE OF APPLIED COMMUNICATIONS, INC. IS CONCURRENT WITH THE U.S. WEST'S INTEREST IN FINANCIALLY RELATED SERVICES. 1985 SAW THE ACQUISITION OF TWO LEASING COMPANIES.
- o ACI IS A MAJOR PROVIDER OF TRANSACTION SYSTEMS SOFTWARE FOR ATM'S, TELLER TERMINALS AND RELATED APPLICATIONS UNDER THE "BASE 24" BRAND.
- o REVENUE GROWTH HAS AVERAGED 34%/YR FOR THE LAST 5 YEARS WITH EARNING GROWINGS IN EXCESS OF 50%/YR FROM LOW LEVELS TO THE CURRENT 12% NET MARGIN.

INPUT

TRANSACTIONS (continued)

- o DESPITE VERY STRONG PERFORMANCE, MORE THAN 4X REVENUES, 5X BOOK AND 34.6X EARNINGS SEEM "RICH."
- o ASSUMING 34%/YEAR EARNINGS GROWTH, THIS TRANSACTION WILL SHOW A POSITIVE IRR (BASED ON NET EARNINGS) IN 1995. AT THAT TIME ACI WOULD EARN \$60 MILLION ON REVENUES OF \$500 MILLION.
- o APPARENTLY ACI HAS GREAT STRATEGIC SIGNIFICANCE IN U.S. WEST'S PLANS TO WARRANT THE PRICE PAID. THE ACQUISITION REPRESENTS 5.7 DAYS OF REVENUE OR 3.6¢ SHARE ON 1985 EPS OF \$9.68. ALSO A CASH ACQUISITION.
- o IN INPUT'S OPINION THESE TWO BUYS ARE EXCELLENT DEMONSTRATIONS OF HOW NOT TO ACQUIRE. ADR WAS APPARENTLY PURCHASED AS A "PORTFOLIO" ITEM WITH NO APPARENT FIT TO THE ACTIVITY OF THE PARENT. ACI - THOUGH A POSSIBLE FIT IS PRESENT - REQUIRES VERY UNLIKELY GROWTH TO PAY OFF REASONABLY.

INPUT

PARAMETERS OF NOMINAL \$100M BUSINESS UNIT

(Pro-Rata On Mean 1984 Industry Values)

	\$M REV	\$M NET	\$M TOTAL ASSETS	PERSONNEL	\$M EQUITY
PROC.	20.87	1.837	25.14	275	12.40
SWARE	18.13	1.106	20.14	179	12.00
PROF	32.16	1.126	18.81	470	7.81
TKY	28.84	2.365	28.27	284	16.11
	100.00	6.434	92.36	1,208	48.32

NET MAR

6.43%

R.O.A.

6.97%

R.P.E.

\$ 82,781

R.O.E.

13.32%

INPUT

NOMINAL UNIT

- o THIS PRO-FORM INDICATES HOW GTEDS-CSD WOULD "LOOK" IF IT EXISTED AT THE PRESENT TIME, HAD \$100 MILLION IN REVENUES AND HAD REVENUES PROPORTIONAL TO THESE IN THE CURRENT CSD BUSINESS PLAN. ALSO ASSUMED IS THAT THE UNIT WOULD BE AVERAGE IN ITS PERFORMANCE ACROSS ALL FOUR LINES OF BUSINESS.
- o NOTE THE REQUIREMENT FOR 1,208 PERSONS. TO REACH THIS GOAL IN 1990 IMPLIES A VERY SUBSTANTIAL RECRUITING EFFORT. NOTE ALSO THE DISPROPORTIONATE NUMBER OF PERSONS (39%) NEEDED TO MEET THE PROFESSIONAL SERVICES REVENUE "QUOTA."
- o COMPARING REVENUE PER EMPLOYEE AT \$82.78K FOR CSD VERSUS \$70.24 FOR ALL OF GTE SHOWS A FAVORABLE 17.85% SURPLUS FOR CSD. IN THIS REGARD, IT IS WORTH NOTING THAT GTE EMPLOYMENT IS HIGH FOR TELEPHONE OPERATIONS WHICH NORMALLY ACHIEVE 90-100K REVENUES PER EMPLOYEE.

INPUT

NORMALINAL (continued)

- o NET MARGIN IS SLIGHTLY BELOW THE INDUSTRY AGGREGATE AT 6.43% VS 6.79%, AGAIN DUE TO THE P.SVC. WEIGHTING. FROM A PURELY FINANCIAL STANDPOINT IT MIGHT BE USEFUL TO CONSIDER DE-EMPHASIZING PROF. SVCS. IF NET PROFITS ARE IMPORTANT. IT IS WORTH NOTING IN THIS RESPECT THAT IN 1983 GTE AS A UNIT RETURNED 7.30% OF SALES AS NET PROFIT.
- o THIS UNIT'S RETURN ON ASSETS AT 6.97% IS MATERIALLY SUPERIOR TO GTE'S AT 3.92%. FROM A REVENUE GENERATION PERSPECTIVE GTE GENERATES \$0.53 PER ASSET DOLLAR WHILE THIS UNIT WOULD GENERATE \$1.08.
- o SINCE THERE IS TYPICALLY LITTLE L.T. DEBT USED BY SERVICE COMPANIES THE CSD UNIT'S R.O.E. OF 13.32% COMPARES VERY FAVORABLY TO THE 5.95% RETURN ON EQUITY PLUS L.T. DEBT & PREFERRED EXHIBITED BY GTE.

INPUT

COMMENTS

- o THE DATA STRONGLY SUGGEST THAT GTEDS SHOULD:
 1. SEEK VALUE FIRST: I.E..
 2. ACQUIRE ONLY THOSE WITH SIGNIFICANT ASSETS EARNING STABLE RETURNS.
 3. PAY LOW RELATIVE MULTIPLES TO THE EXTENT POSSIBLE.
 4. DIVERSIFY TO REDUCE RISK OF A SINGLE LARGE ACQUISITION.
 5. WATCH TIMING FACTORS WITH RESPECT TO THE PUBLIC MARKETS.
 6. AVOID BIDDING AGAINST NAIVE BUYERS.
 7. LEAD WITH THE CALCULATOR, NOT THE HEART.
- o CONSIDER THAT A SMALL PART OF AN INDUSTRY GROUP IS BEING ACQUIRED, NOT THE INDUSTRY. RISK AND VOLATILITY IS MUCH HIGHER AT THE FIRM LEVEL.

INPUT

GTEDS SCREEN

COMPANY NAME SYSTEMATION INC.ADDRESS Two Commerce Park Sq, 23200 Chagrin Blvd, Cleveland, OH 44122PHONE # (216) 464-8616PRESIDENT William C. StilsonPUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$16.7M 1985, \$2.4M TelcoEMPLOYEES 250

INDUSTRY MARKETS discrete mfg., transportation, utilities, banking and
finance, insurance, medical and hospital, education, total distribution,
services, other

GEOGRAPHIC MARKETS total U.S.

SUMMARY System Software and implementation of integrated systems
are offered. Professional Services include management consulting,
hardware and software evaluation, project planning and control, and train-
ing. Extensive Telephone/Communication development projects include Cust-
omer Billing System, Toll Credit Card System, Network Administration, Dir-
ectory Scheduling and Order Entry System. Planning joint effort with
Ameritech and has done work for United Tel. Systems run on IBM mainframe,
Honeywell and Burroughs. Impressive mktg. presentation materials. Steady
revenue growth.

GTEDS SCREEN

COMPANY NAME SAZTEC

ADDRESS 27520 Hawthorne Blvd. Rolling Hills Estates, CA 90274

PHONE # (213) 544-0337

PRESIDENT Thomas Reed

PUBLIC or PRIVATE Private

SERVICES OFFERED Software/Professional

REVENUE \$10 - 15 Million Telco = 33%

EMPLOYEES 750

INDUSTRY MARKETS Total Mfg., Transportation, Utilities, Bank and Finance, Insurance, Medical & Hospital, Total Gov., Other

GEOGRAPHIC MARKETS Total U.S., Europe (England, Scotland), Australia

SUMMARY Saztec's many international offices provide programming and processing, database electronic publishing, library services and utilities management services. Telcos have used Saztec for technical consulting, engineering, software design and data capture services. Specific projects for BOC's include CAMS, Cable Analyzed Mechanized System for cable status, DCRIS, Distributive Customer Record Inventory System, LMOS, Loop Maintenance Operation Program for repair service, FACS, Facility and Assignment Control which automates Loop Assignment Centers. Clients include AT&T, CONTEL, and South Central Bell.

GTEDS SCREEN

COMPANY NAME PERFORMANCE SYSTEMS INC.ADDRESS 30 Courthouse Square Rockville, MD 20850PHONE # (301) 762-0300PRESIDENT John WintermutePUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$4,064,000 (E) - 1984 TELCO = 20%EMPLOYEES 40INDUSTRY MARKETS total mfg., transportation, utilities, insurance,
medical and hospital, education, total dist., total gov., fed. gov.,
services, otherGEOGRAPHIC MARKETS total U.S., total International, Europe

SUMMARY Products include "SCERT II" which is used for capacity plan-
ning on IBM systems by projecting the performance of hardware, software, and
networks and "Pheobe", an interactive input processor and results processor.
The products run in IBM mainframes or IBM PC/AT machines. This is a
"Planning" package selling at \$50K, which company claims is popular with
Telco DP Depts. Additionally, PSI provides product related consulting
at a fee of \$550 per day.

GTEDS SCREEN

COMPANY NAME MANAGEMENT SCIENCES INC.ADDRESS 6022 Constitution Avenue - Albuquerque, NM 87110PHONE # (505) 255-8611PRESIDENT M.K. BlemelPUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$1 - 2 Million - 1985 Telco = DKEMPLOYEES 18INDUSTRY MARKETS Total mfg., discrete mfg., process mfg., transportation,
utilities, total government, other.GEOGRAPHIC MARKETS total U.S., total International, Canada, Europe, Other

SUMMARY MSI supplies design evaluation software and services to perform computer-aided quality engineering tasks on DEC VAX, PRIME and IBM mainframes and PC's. For the PC, MSI offers PC-BELLCORE, an electronic reliability prediction program for telecommunications, PC-Availability which uses Markov Analysis for optimum system configuration, PC Notebook, a data management package, and PC-Predictor. PREDICTOR, a mainframe product, gives prediction of reliability, safety and maintenance for any stage of systems development. Fault Tree Analysis Program has applications in risk management and safety analysis. Mainframe programs are also available through GEISCO and UCCEL time sharing networks. MSI also offers seminars and consulting services to support its software line.

GTEDS SCREEN

COMPANY NAME GEOGRAPHIC SYSTEMS INC.

ADDRESS 204 Andover St. Andover, MA 01810

PHONE # (617) 470-3760

PRESIDENT John P. Bowden

PUBLIC or PRIVATE Private

SERVICES OFFERED Software/Professional

REVENUE \$1 - 2 Million - 1985 Telco = 5%

EMPLOYEES 20

INDUSTRY MARKETS total manufacturing, utilities, banking and
finance, insurance, total distribution, retail distribution, wholesale
distribution, total government, federal government

GEOGRAPHIC MARKETS total U.S.

SUMMARY GSI offers packaged software used by sales and marketing
departments for geographic analysis and forecasting. Products offered
are GEOMAP which provides mapping by geographic units, GEOSTAR for sales
territory allocation and realignment based on demand, GEOFILE, a
cartographic data file, and GEOBUILD for custom defined territories.
New England Telephone currently uses GSI for customized boundary files
of wire centers and telephone exchanges. Software prices range from
\$5K`- 200K. Consulting services on output from modeling are available.
Hardware used is DEC VAX or IBM mainframe.

GTEDS SCREEN

COMPANY NAME EVANS, GRIFFITHS & HART INC.

ADDRESS 55 Waltham St. Lexington, MA 02173

PHONE # (617) 861-0670

PRESIDENT Thomas G. Evans, PH.D.

PUBLIC or PRIVATE Private

SERVICES OFFERED Software/Professional

REVENUE \$1 - 2 Million Telco = 30%

EMPLOYEES 20

INDUSTRY MARKETS Utilities, Banking & Finance, Medical & Hospital,
Other

GEOGRAPHIC MARKETS total U.S., Total International, Canada, Europe,
Other

SUMMARY EGH designs and develops systems software for the DEC VAX and
the PDP-11. Licensed products marketed are VSOP, VAX Service Order
Processor which analyzes service orders by billing telephone number,
TBD-PLUS, a traffic data base used for directory assistance, KDSS, a
Key-to-disk data entry system, VSELECT, a sequential record extractor,
and DIAL UP, a terminal-line communications link. Consulting as part
of the development of custom software is provided at a fee of \$100 per
hour.

GTEDS SCREEN

COMPANY NAME DIGITAL COMMUNICATIONS ASSOCIATED INC.

ADDRESS 100 Alderman Drive Alpharetta, GA 30201

PHONE # (404) 442-4000

PRESIDENT Bertil Nordine

PUBLIC or PRIVATE Public

SERVICES OFFERED Software/Professional

REVENUE \$83,717,000 - 1985 Telco = DK

EMPLOYEES 1000

INDUSTRY MARKETS total manufacturing, transportation, utilities,
total distribution, services

GEOGRAPHIC MARKETS total U.S., Europe

SUMMARY DCA develops, manufactures and markets hardware and software
that facilitates data transfer between terminals and computers. Their
networking equipment includes the IRMA printed circuit board for micro-
to-mainframe links. IRMA FASTLINK, an intelligent packetized modem,
Netlink, a high-speed, time division multiplexor. DCA's ET1 Line Pricer
software package has been used by AT&T, GTE, and MCI to calculate rates
for voice and data. Many network management tools, and software includ-
ing X.25 packet-switching/gateway interface are offered. DCA is an
OEM with AT&T and has done work for Ameritech, Pacific Bell, U.S. West,
Lincoln Tel and Tel (Prairie Link) and European PTTs.

GTEDS SCREEN

COMPANY NAME DECISION FOCUS INC.ADDRESS 5 Palo Alto Square, ste. 410 Palo Alto, CA 94303PHONE # (415) 494-7721PRESIDENT Dean W. BoydPUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$6,096,000 (E) - 1984 TELCO 5 - 10%EMPLOYEES 60INDUSTRY MARKETS utilities, total gov., fed. gov., svcs, otherGEOGRAPHIC MARKETS total U.S., Pacific

SUMMARY Offers the "Arborist", a Texas Instrument Software Package
which serves as a decision tree O.R. support tool. Is priced at \$595 and
runs on Vax 11/78, Microvax II, IBM PC, and TI computers. DFI provides
management consulting and decision making through computer models and has
developed a very complex Pacific Pricing Model (Multi-\$M) which is a soft-
ware system used for preparing rate case submissions and internal pricing
studies for PAC Bell. Plans to offer to other Telops. Claims 10% Telco
revenue, but included also due to T.I. relationship. Offers consulting and
decision support services. Extensive electric utility experience claimed.

GTEDS SCREEN

COMPANY NAME DATAMAP INC.

ADDRESS 6874 Washington Ave. South Eden Prairie, MN 55344

PHONE # (612) 941-0900

PRESIDENT Grant I. Warfield

PUBLIC or PRIVATE Public

SERVICES OFFERED Software

REVENUE \$600,000 - 1985 Telco = 10%

EMPLOYEES 14

INDUSTRY MARKETS utilities, banking and finance, insurance, medical
and hospital, total dist., retail dist., wholesale dist.

GEOGRAPHIC MARKETS total U.S.

SUMMARY Data Map integrates demographic and geographic data base
information with graphics to provide mapping services. Custom software
and consulting to Telcos included establishing the standard for cellular
phone maps for AT&T. Their mapping services have also been used for
direct marketing campaigns and comparative subcell analysis. Hardware
is DEC PDP11 and IBM PC, but will customize. Fee for custom programming
is \$100/hr and individual maps can be purchased.

GTEDS SCREEN

COMPANY NAME DMW GROUP INC.ADDRESS 2020 Hogback Rd. Ann Arbor, MI 48104PHONE # (313) 971-5234PRESIDENT Dixon DollPUBLIC or PRIVATE PrivateSERVICES OFFERED SoftwareREVENUE \$6,096,000 (E) - 1984 TELCO = 15%EMPLOYEES 60INDUSTRY MARKETS total mfg., trans., utilities, bank and finance,
insurance, education, total dist., total gov., services, otherGEOGRAPHIC MARKETS total U.S., New England, Middle Atlantic, West
North Central, South Atlantic, East South Central, West South Central,
Mountain, total International, Canada, other

SUMMARY The five main software products are "NetWorker", which designs
hierarchial data communications networks, "NDMS/PC" similiar to "NetWorker"
on a PC, "Telecost" a call accounting system which uses a tariff data base
and provides seven call pricing alternatives, "TOP" a long distance opti-
mization package and "Teletrack" which provides inventory and order track-
ing. Package costs range from \$3K to \$50K. Hardware includes IBM 360, 370,
30XX or 4300, DEC VAX, and Amdahl. Founded in 1971, DMW has provided con-
sulting on Equipment Evaluation, Network Design and Strategic Planning.
Telecomm user oriented as contrasted to carrier, but claims carrier clients
include GTE.

GTEDS SCREEN

COMPANY NAME COMMERCIAL SOFTWARE INC.ADDRESS 370 Lexington Ave. New York, NY 10017PHONE # (212) 557-0350PRESIDENT Anthony AbbottPUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$2,000,000 - 1985 TELCO = DKEMPLOYEES 60INDUSTRY MARKETS total mfg., utilities, banking, education, total gov.,
fed. gov., state and local gov., otherGEOGRAPHIC MARKETS total U.S., total International

SUMMARY Commercial Software has seven software products. Among them
are "TASC" for cost allocation, "TEMS" a telecommunication equipment
management system which writes work orders, a directory "IDS" for online
inquiry and credit card authorization, "TRAM" a trouble reporting management
system, a wire and cable system used for purchasing switches, a central
network management system which controls a network from a single location and
"NODE 1", a network optimization design engineering system. All packages
run on VAX, but cost allocation pack may run on IBM. Package pricing
ranges from \$100 - \$250K.

GTEDS SCREEN

COMPANY NAME COMTECH SYSTEMS INC.

ADDRESS 1105 Schrock Rd, Ste. 816 Columbus, OH 43229

PHONE # (614) 431-2345

PRESIDENT Thomas D. Wittkopf

PUBLIC or PRIVATE Private

SERVICES OFFERED Professional

REVENUE \$8,208,000 (E) - 1984 TELCO = 18%

EMPLOYEES 120

INDUSTRY MARKETS total mfg., utilities, bank and finance, insurance,
medical and hospital, total dist., retail dist., wholesale dist., othe:

GEOGRAPHIC MARKETS total U.S.

SUMMARY Comtech is a professional services firm which provides
consulting in the area of systems design and analysis. The firm has done
systems programming for AT&T and Bell Labs involving switching systems in
C and UNIX. Consulting fees range from \$40 - \$70 per hour. Approximately
\$1.5 million of company revenue came from Telcos last year. Concentration
of work is in Columbus, Cincinnati, and Tampa.

GTEDS SCREEN

COMPANY NAME COMPUTER INNOVATIONS

ADDRESS 55 E. Jackson Chicago, IL 60604

PHONE # (312) 663-5930

PRESIDENT Joseph Mill

PUBLIC or PRIVATE Private

SERVICES OFFERED Software/Professional

REVENUE \$2,032,000 (E) - 1984 TELCO = 10 - 60%

EMPLOYEES 20

INDUSTRY MARKETS total mfg., discrete mfg., process mfg., transportation
utilities, banking and finance, medical and hospital, education, total
distribution, retail dist., wholesale dist., other

GEOGRAPHIC MARKETS total U.S.

SUMMARY Company provides contract programming and Custom Design.
Work has included the development of utility programs for clients such
as Bell Labs and GTE. Firm has also done switching circuit analysis in
the area of electrical Engineering. Though Computer Innovations has
clients nationwide, the firm mostly concentrates upon the midwest.

GTEDS SCREEN

COMPANY NAME COMPUTER GENERATION INC.

ADDRESS 3301 Buckeye Rd. Atlanta, GA 30341

PHONE # (404) 458-2371

PRESIDENT Jackie Ward

PUBLIC or PRIVATE Private

SERVICES OFFERED Professional

REVENUE \$6,840,000 (E) - 1984 TELCO = 70%

EMPLOYEES 100

INDUSTRY MARKETS total mfg., util., bank and finance, insurance,
total distribution, total gov., other

GEOGRAPHIC MARKETS total U.S.

SUMMARY Offers "EDCS" Data collection system for switches as a turnkey,
toll collection turnkey w/switch interface, SPC switch monitoring, call
rating (16 periods, 20 zones, V&H), net control maintenance, rate DB
update of switch download, traffic analysis. Emphasizes switch and net
operations plus offers STS and hotel charge systems. DEC based - Vax.
At lease some in UNIX/C. System prices range \$100K - \$1M. Offers prof.
svcs. at \$40/45 hr pgmmr and \$80-100 consulting.

GTEDS SCREEN

COMPANY NAME COMPUTOSERVICE INC.

ADDRESS 1315 Stadium Rd. Mankate, MN 56001

PHONE # (507) 625-1691

PRESIDENT Richard E. Kendall

PUBLIC or PRIVATE Private

SERVICES OFFERED Software/Professional

REVENUE \$4,000,000 - 1985 TELCO = 75%

EMPLOYEES 75

INDUSTRY MARKETS utilities, other

GEOGRAPHIC MARKETS total U.S.

SUMMARY Software applications for General Ledger and Accounting
on TI minicomputers. Other applications are inventory and office automation
Software runs on IBM 4341. Firm provides billing and toll rating on
batch. Has been involved with the installation of TI business systems.
Professional Services involve custom software and special software
applications.

GTEDS SCREEN

COMPANY NAME BMC SOFTWARE INC.

ADDRESS PO Box 2002 Sugarland, TX 77478

PHONE # (713) 240-8800

PRESIDENT John Moores

PUBLIC or PRIVATE Private

SERVICES OFFERED Software

REVENUE \$ 15 Million - est. 1985 Telco = DK

EMPLOYEES 150

INDUSTRY MARKETS total manufacturing, transportation, utilities,
banking and finance, insurance, medical and hospital, education, total
government, services, other

GEOGRAPHIC MARKETS total U.S., total International, Canada, Europe

SUMMARY BMC markets several products for ICCS, ICM, VM and VTAM to
enhance and improve the performance of IBM mainframes. COMINFO and 327C
Optimizer improve network performance by measuring transaction response
time and resource use. Database utilities include Data Packer II for
data compression, Load Plus for reorganization and Prefix Resolution Plus
for relationships between data bases. IMS/DC Enhancements offered are
Screen Plus for formatting, Local Copy Plus for hard copy printouts, and
BMP RESTART for batch message processing. Software introduced in 1978
and pricing ranges from \$7500 to \$39K.

GTEDS SCREEN

COMPANY NAME TEKNOLEDGE INC.

ADDRESS 525 University Ave, Ste. 200 Palo Alto, CA 94301

PHONE # (415) 327-6600

PRESIDENT Lee M. Hecht

PUBLIC or PRIVATE Public

SERVICES OFFERED Software/Professional

REVENUE \$6,225,000 - 1985 TELCO = 20%

EMPLOYEES 175

INDUSTRY MARKETS total mfg., transportation, utilities, banking and
finance, medical and hospital, education, total dist., total gov., other

GEOGRAPHIC MARKETS total U.S., Pacific, total International, Canada,
other

SUMMARY Professional services and systems software products in the area
of applied artificial intelligence are offered. Company focus is on know-
ledge engineering, commonly termed expert systems. The "M.1" programming
language runs on IBM PC and compatibles, while the "S.1" operates on DEC
VAX, AT&T 7300, NCR Tower 32, Xerox 1100 in addition to IBM PCs. "S.1"
release for mainframes is planned. The company also provides extensive
training through methodology courses. Clients include Bell Communications
AT&T, Bell Northern. Emphasis on expert systems for diagnostics. Included
this screen because of AI interest. Writing in C & Lisp. Also provides
training and seminars.

GTEDS SCREEN

COMPANY NAME SYSTEMATION INC.ADDRESS Two Commerce Park Sq, 23200 Chagrin Blvd, Cleveland, OH 44122PHONE # (216) 464-8616PRESIDENT William C. StilsonPUBLIC or PRIVATE PrivateSERVICES OFFERED Software/ProfessionalREVENUE \$16.7M 1985 Telco = 14.4%EMPLOYEES 250

INDUSTRY MARKETS discrete mfg., transportation, utilities, banking and
finance, insurance, medical and hospital, education, total distribution,
services, other

GEOGRAPHIC MARKETS total U.S.SUMMARY System Software and implementation of integrated systems

are offered. Professional Services include management consulting,
hardware and software evaluation, project planning and control, and train-
ing. Extensive Telephone/Communication development projects include Cust-
omer Billing System, Toll Credit Card System, Network Administration, Dir-
ectory Scheduling and Order Entry System. Planning joint effort with
Ameritech and has done work for United Tel. Systems run on IBM mainframe,
Honeywell and Burroughs. Impressive mktg. presentation materials. Steady
revenue growth.

GTEDS SCREEN

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ADDRESS 525 University Ave, Ste. 200 Palo Alto, CA 94301

PHONE # (415) 327-6600

PRESIDENT Lee M. Hecht

PUBLIC or PRIVATE Public

SERVICES OFFERED Software/Professional

REVENUE \$6,225,000 - 1985 TELCO = 20%

EMPLOYEES 175

INDUSTRY MARKETS total mfg., transportation, utilities, banking and
finance, medical and hospital, education, total dist., total gov., other

GEOGRAPHIC MARKETS total U.S., Pacific, total International, Canada,
other

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training and seminars.

GTEDS SCREEN

INCLUDED BY GTEDS MANAGEMENT REQUEST

COMPANY NAME Computer Horizons

ADDRESS 747 Third Avenue New York, NY 10017

PHONE # (212) 371-9600

PRESIDENT John Cassese

PUBLIC or PRIVATE Public, NASDAQ, approximately 2.5 MM shares out

SERVICES OFFERED Systems design, Architecture, Programming

REVENUE \$50.9 MM for year ended 2/28/86 Telco = 43%

EMPLOYEES 754

INDUSTRY MARKETS Communications, Finance, Other (mfg. & fed. gov.)

GEOGRAPHIC MARKETS 21 Offices nationwide, heavy concentrations of
revenue in Northeast and Orlando, Florida

SUMMARY Fast growing until 1985, CHRZ originally specialized in tele-
communications (AT&T) and Finance (banking & brokerage). Recent trend
has been to emphasize manufacturing and Federal government in face of
slower growth in primary areas. Profitability above industry average
but decaying of late. Productivity about average, as is ROA. Best
financial performance in 1984. Stock is extremely volatile and thinly
traded. Drexel Burnham has acted as a market maker and syndicator. Em-
phasized geographic expansion until recently. New emphasis on searching
out small P.S. for acquisition by CHRZ.

GTEDS SCREEN

COMPANY NAME DATA ARCHITECTS, INC.

ADDRESS 245 Winter Street Waltham, MA 02154

PHONE # (617) 890-7730

PRESIDENT Norman Zachary

PUBLIC or PRIVATE Public

SERVICES OFFERED Software/Professional

REVENUE \$20,945,000 - 1985 Telco = 20%

EMPLOYEES 202

INDUSTRY MARKETS utilities, banking and finance, insurance

GEOGRAPHIC MARKETS total U.S., total International, Canada, Europe

SUMMARY Custom Software, Turnkey Systems and Professional
services are offered by DAI. Projects for Telcos are SONAR, a Service
Order Negotiation and Retrieval System which is used by U.S. West for
service order processing for its operating companies, NICS, a Network
Information and Communication system for processing telephone network
traffic messages for the British Columbia Telephone Company, and CHIPS a
Billing System for GTE Sprint. Also DAI has plans for a network project
with S.N.E.T. DAI uses Tandem Non Stop Computers.

